



**Food and Agriculture
Organization of
the United Nations**



**World Health
Organization**

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REP14/FH

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX ALIMENTARIUS COMMISSION
Thirty-seventh Session
Geneva, Switzerland, 14 - 18 July 2014

**REPORT OF THE FORTY-FIFTH SESSION OF THE
CODEX COMMITTEE ON FOOD HYGIENE**
Ha Noi, Viet Nam, 11-15 November 2013

NOTE: *This report includes Codex Circular Letter CL 2013/29-FH*

CODEX ALIMENTARIUS COMMISSION



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CL 2013/29-FH

TO: Codex Contact Points
Interested International Organizations

FROM: The Secretariat
Codex Alimentarius Commission
Joint FAO/WHO Food Standards Programme
FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy

SUBJECT: Distribution of the report of the Forty-fifth Session of the Codex Committee on Food Hygiene (REP14/FH)

The report of the Forty-fifth Session of the Codex Committee on Food Hygiene (CCFH) is attached. It will be considered by the Thirty-seventh Session of the Codex Alimentarius Commission, (Geneva, Switzerland, 14 - 18 July 2014).

MATTERS FOR ADOPTION BY THE CODEX ALIMENTARIUS COMMISSION:

Proposed Texts for adoption

1. Proposed Amendments to definitions for hazard characterization, risk communication, risk estimate and risk management in the *Principles and Guidelines for the Conduct of Microbiological Risk Assessment* (CAC/GL 30-1999) (REP14/FH para. 10, Appendix II).

Proposed Draft Standards and Related Texts at Steps 5/8 of the Procedure

2. Proposed Draft Guidelines for the Control of *Trichinella* spp. in meat of Suidae (REP14/FH para. 64 and Appendix III).
3. Proposed Draft Guidelines for the Control of *Taenia saginata* in meat of domestic cattle (REP14/FH para. 64 and Appendix IV); and
4. Proposed Draft Revision of the Code of Hygienic Practice for Spices and Dried Aromatic Herbs (CAC/RCP 42-1995) (REP14/FH para. 79 and Appendix V).

Governments and interested international organizations are invited to comment on the above texts and should do so in writing, by e-mail to the Secretariat, Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme, Viale delle Terme di Caracalla, 00153 Rome, Italy : codex@fao.org, **before 15 April 2014.**

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SUMMARY AND CONCLUSIONS

The Forty-fifth Session of the Committee on Food Hygiene reached the following conclusions:

MATTERS FOR ADOPTION BY THE 37TH SESSION OF THE CODEX ALIMENTARIUS COMMISSION:

The Committee agreed to:

- Forward the Amendments to the Definitions of the *Principles and Guidelines for the Conduct of Microbiological Risk Assessment* (CAC/GL 30 -1999) for adoption (para. 10 and Appendix II);
- forward the Proposed Draft Guidelines for the Control of *Trichinella* spp. in meat of Suidae and for the Control of *Taenia saginata* in meat of domestic cattle; and the revised Proposed Draft *Code of Hygienic Practice for Spices and Dried Aromatic Herbs* (CAC/RCP 42-1995) for adoption at Step 5/8 (para. 64 and Appendix III and IV; and para. 79 and Appendix V, respectively).

MATTERS FOR ACTION BY THE COMMISSION (NEW WORK)

The Committee agreed to propose to the Commission to approve new work on:

- Guidelines for the Control of Nontyphoidal *Salmonella* spp. in Beef and Pork Meat (para. 107 and Appendix VI); and
- Guidelines on the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites (para. 111 and Appendix VII).

MATTERS OF INTEREST TO THE COMMISSION AND FAO/WHO

The Committee agreed to:

- further consider an Annex on the statistical and mathematical considerations to the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods* (CAC/GL 21-1997) (para.14);
- return the Proposed Draft Code of Hygienic Practice for Low-Moisture Foods to Step 2 for redrafting, circulation for comments at Step 3 and consideration at its next session (para. 94);
- continue consideration of the need to revise the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003) (para. 100); and
- a Forward Workplan for the Committee and to a revised "Process by which the Committee on Food Hygiene (CCFH) will Undertake its Work", which includes revised criteria and weighting values to be applied when considering new work proposals and updating the Forward Workplan and to use the criteria on an experimental basis (paras 113 – 114 and Appendices VIII and IX, respectively).

MATTERS OF INTEREST TO OTHER COMMITTEES

Codex Committee on General Principles (CCGP)

The Committee:

- agreed to request the 28th Session of the Committee on General Principles (CCGP) to consider the need to amend the definitions of hazard characterization and risk estimate in the Procedural Manual (para. 10).

REQUEST TO FAO/WHO

The Committee requested FAO/WHO to:

- extend the work already done on illustrating the levels of public health protection that can be achieved when establishing a negligible risk compartment; to develop examples to assist competent authorities in deciding on options for ongoing verification of a negligible risk compartment and for judging the equivalence of different options for monitoring and review of negligible risk compartments as in sections 7.3 and 9 of the Guidelines for the Control of *Trichinella* spp. in meat of Suidae (para. 54)
- to continue provision of advice on the criterion for *Salmonella* in spices (para. 77) and the advice on low-moisture foods as requested by the 44th Session of CCFH and to use criteria for the ranking of low-moisture foods as identified by the 45th Session of CCFH (paras 90 – 92).

INTRODUCTION

1. The Codex Committee on Food Hygiene (CCFH) held its Forty-fifth Session in Ha Noi, Viet Nam, from 11-15 November 2013, at the kind invitation of the Governments of the United States of America and Viet Nam. Dr Emilio Esteban, of the United States of America Department of Agriculture, chaired the Session and Dr Vu Ngoc Quynh, Director of the Viet Nam Codex Office, served as co-Chair. The Session was attended by 239 delegates representing 73 member countries, one member organization and 16 international organizations including FAO and WHO. A complete list of participants, including the Secretariats, is attached as Appendix I.

OPENING OF THE SESSION

2. Mr David B. Shear, the Ambassador of the United States of America to Viet Nam opened the Session. Mr Shear noted that this was the 50th Anniversary of Codex and the first Codex meeting held in Viet Nam, making it a notable event. He remarked that the CCFH work was an important engine behind the tremendous growth in global trade of food and agricultural products in recent years.

3. Professor Nguyen Thanh Long, Deputy Minister of Health and Chair of the Viet Nam National Codex Committee, also addressed the Committee. Professor Long said that the Viet Nam Government places a high value on the work of Codex, particularly when it comes to protecting the health of the consumer and ensuring fair practices in the food trade. He indicated that the Viet Nam food standards and national regulations on food additives, contaminants in food, maximum residue levels of pesticides and veterinary drugs are based on Codex standards and that about 70% of Viet Nam food standards are harmonized with Codex standards.

4. Mr Brian Ronholm, Deputy Under Secretary for Food Safety, U.S Department of Agriculture, also addressed the delegates. Mr Ronholm expressed his appreciation to Viet Nam for the opportunity to co-host the Session and stressed the benefits that accrue to all Codex Members through co-hosting. He discussed the changes that have occurred in Codex over the past 50 years, and encouraged the delegates to take confidence from the legacy of Codex's achievements as they faced new challenges.

Division of Competence

5. The Committee noted the division of competence between the European Union and its Member States, according to paragraph 5, Rule II of the Procedure of the Codex Alimentarius Commission, as presented in CRD 1.

ADOPTION OF THE AGENDA (Agenda Item 1)¹

6. The Committee adopted the Provisional Agenda as its Agenda for the Session and agreed to:
- Establish an in-session working group on the proposed draft Guidelines for Control of Specific Zoonotic Parasites in Meat: *Taenia saginata* in Meat of Domestic Cattle and, subject to time availability, outstanding matters of the proposed draft Guidelines for Control of Specific Zoonotic Parasites in Meat: *Trichinella* spp. of Suidae, led by the European Union and New Zealand and working in English, French and Spanish to consider comments submitted and make recommendations for consideration by the Plenary; and
 - Consider the Agenda Items in the following order: 1, 2, 3, 5, 6, 4, 7, 8, 9 and 10.

MATTERS REFERRED BY THE CODEX ALIMENTARIUS COMMISSION AND/OR OTHER CODEX COMMITTEES TO THE FOOD HYGIENE COMMITTEE (Agenda Item 2)²

7. The Committee noted the information presented in CX/FH 13/45/2 related to the decisions of the 36th Session of the Commission.

Definitions in the *Principles and Guidelines for the Conduct of Microbiological Risk Assessment (CAC/GL 30-1999)*

8. The Committee noted the proposal of the Codex Secretariat to align several definitions, i.e. hazard characterization, risk communication, risk estimate and risk management, in the *Principles and Guidelines for the Conduct of Microbiological Risk Assessment*, adopted on an interim basis by the 22nd Session of the Commission (1999), with the definitions included in the Procedural Manual, adopted by the 26th Session of the Commission (2006).

9. The Committee, while supporting the proposal, agreed to further amend the definitions of:
- Hazard characterization, by deleting the last two sentences which refer to the modalities for hazard characterization of chemical and of biological or physical agents;
 - Risk estimate, by adding a reference to qualitative estimation, for consistency with the definition of risk characterization included in the *Principles and Guidelines for the Conduct of Microbiological Risk Assessment (CAC/GL 30-1999)*.

¹ CX/FH 13/45/1.

² CX/FH 13/45/2; comments of European Union (CRD 16).

10. The Committee agreed to forward the proposed amendments to the 37th Session of the Commission for approval (Appendix II). The Committee further agreed to request the 28th Session of the Committee on General Principles (CCGP) to consider the need to amend the definitions of hazard characterization and risk estimate in the Procedural Manual.

MATTERS ARISING FROM THE WORK OF FAO, WHO AND OTHER INTERNATIONAL INTERGOVERNMENTAL ORGANIZATIONS (Agenda Item 3)

PROGRESS REPORT ON THE JOINT FAO/WHO EXPERT MEETINGS ON MICROBIOLOGICAL RISK ASSESSMENT (JEMRA) AND RELATED MATTERS (Agenda Item 3a)³

Establishment and application of microbiological criteria for food

11. Referring to the FAO/WHO Technical Meeting on the Statistical and Mathematical Considerations for the Elaboration of Microbiological Criteria (Rome, Italy, 8-10 October 2013), the Representative of FAO, speaking on behalf of FAO and WHO, provided the Committee with an overview document developed by the meeting. Specific reference was made to the target audience and the three technical aspects considered: (i) basic concepts related to microorganisms in foods and sampling; (ii) making decisions about an individual product lot; and (iii) making decisions related to process verification. The Representative also informed the Committee that FAO and WHO were working to further develop the document to include additional text and in particular graphic material as defined by the meeting.

12. The Committee recalled that the work was requested by the CCFH to assist in the development of an annex on statistical and mathematical aspects to the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods* (CAC/GL 21-1997).

13. The Delegation of Japan noted that it might be necessary to establish an electronic working group once the document is finalized to make a decision regarding the Annex.

Conclusion

14. The Committee agreed that it was not in a position to take a decision on the Annex at this stage and agreed to establish an electronic working group (EWG), led by Japan and Finland, and working in English only, to examine the document of the FAO/WHO Technical Meeting in order to provide recommendations on whether it should continue development of an Annex on the statistical and mathematical considerations, and if so, provide a proposal as to the structure and content of this Annex.

Practical examples for the establishment and implementation of microbiological criteria

15. The Representative of FAO also mentioned that FAO and WHO had concluded the peer-review activities of the practical examples for the establishment and implementation of microbiological criteria and was in the process of providing the seven examples in a special issue on microbiological criteria in food to be published by a peer reviewed journal, *Food Control*, scheduled for August 2014. The Representative stated that the examples would also be made available on the FAO and WHO websites.

Parasites in Food and their impact in public health and trade

16. Referring to the FAO/WHO Expert Meeting on Risk-based Examples for Control of *Trichinella* spp. and *Taenia saginata*, the Representative of FAO explained that the meeting developed several examples (scenarios) for the two parasites and estimated the level of residual risk for each example, which was calculated as infected portions per million servings of pig meat for *Trichinella* spp. and the number of human cases for *Taenia saginata*, respectively. The summary of the draft report was provided to the Committee. The Representative also stated that the report will be finalized shortly and will be available on the FAO and WHO websites.

17. The Representative of FAO said that the peer review activities of the risk profiles for *Trichinella* spp. and *Taenia saginata* had been finalized and the documents were available on the FAO and WHO websites.⁴

18. Regarding the final meeting report on the ranking of foodborne parasites, the Representative of FAO mentioned that this document consisted of the ranking of foodborne parasites, socio-economic/trade impacts for the ranked parasites and risk management options, the methodology used, parasite-specific information generated by the experts for the 24 ranked parasites plus a glossary of terms and the regional reports on foodborne parasites developed by the experts. This document will be available online shortly.

³ CX/FH 13/45/3; comments of Brazil (CRD 19).

⁴ FAO: <http://www.fao.org/food/food-safety-quality/a-z-index/foodborne-parasites/en/> ;
WHO: <http://www.who.int/foodsafety/micro/jemra/assessment/parasites/en/>

Microbiological hazards associated with spices and dried aromatic herbs and low-moisture foods

19. With regards to the structured work in this area, the Representative of WHO referred to the preliminary summary findings. From the rapid structured review conducted, the Representative noted the following: *Salmonella* spp. was the most frequently reported pathogen across all food categories; dried protein products were the most frequently contaminated food category suspected or associated with human illness; dried protein products contaminated with *Salmonella* spp. were the most frequently reported food-hazard combination suspected or associated with illness; *Salmonella* spp. in dried protein products and confections accounted for the greatest number of outbreaks affecting vulnerable groups such as children. In terms of the relevant importance of spices, the Representative indicated that black pepper might be of specific concern.

20. The Representative requested support from Members for the provision of scientific advice on this work via data and/or expertise.

Expert Meeting on methodology for detection and enumeration of *Vibrio parahaemolyticus* and *Vibrio vulnificus* in seafood

21. The Representative of WHO provided the Committee with an update on a workshop on *Vibrio* methodologies scheduled to be held in Santiago, Chile, on 2-6 December 2013.

22. The Committee expressed their appreciation to FAO and WHO for their work on the provision of scientific advice, which was essential for the Committee to undertake numerous aspects of its work.

INFORMATION FROM THE WORLD ORGANIZATION FOR ANIMAL HEALTH (OIE) (Agenda Item 3b)⁵

23. In addition to information provided in CX/FH 13/45/4, the Observer from OIE informed the Committee that the revised Chapter 8.14 on Infection with *Trichinella* spp. had been adopted at the 81st General Session in May 2013, and is included in the 2013 version of the OIE *Terrestrial Animal Health Code*.

24. The objective of the chapter is to recommend control measures at the farm level to prevent food borne illness in humans. The chapter provides provisions for establishing and maintaining a 'negligible risk compartment' in pigs kept under controlled management conditions. The articles dealing with international trade of meat and meat products of suids and equids include a cross reference to the relevant Codex Guidelines.

25. The Observer from OIE informed the Committee that the chapter incorporates a risk-based approach based on consideration of both pre- and post-harvest control measures and involved active collaboration between the OIE and Codex in its development, and is an excellent example of how the OIE and Codex worked together to produce a robust output.

26. The Observer from the OIE informed the Committee that the former OIE *Terrestrial Code* chapter on Echinococcosis/hydatidosis had been separated into two chapters: *E. granulosus*, and *E. multilocularis* and were adopted at the 81st General Session in May 2013.

27. The Observer further informed the Committee that the OIE, through its Animal Production Food Safety Working Group (APFSWG) has explored the feasibility of developing a standard for the control of *Salmonella* spp. in food-producing animals other than poultry to reduce foodborne illness, by applying measures at the farm level. The APFSWG has recommended that should Codex initiate new work on *Salmonella* spp. in pigs and cattle, the OIE should develop recommendations for the control of *Salmonella* spp. in pigs and cattle to address their pre-harvest management that complement the Codex guidelines, as this would ensure a whole food chain approach.

28. In addition, the Observer noted that OIE encourages its national Delegates to collaborate with national Delegates to Codex, in particular to discuss at the national level alignment of relevant standards under development by the respective organizations.

29. The Observer confirmed OIE's commitment to continue to explore ways to harmonise OIE and Codex approaches in the development of standards of mutual interest in the food production continuum and noted their active participation in the CCGP electronic working group on OIE/Codex Cooperation where this is being considered.

30. The Committee thanked the Observer from OIE for the useful information and noted the complementarity of Codex and OIE standards in the management of risk along the food chain.

INFORMATION FROM THE INTERNATIONAL STANDARDS ORGANIZATION (ISO) (ISO/TC/SC 9) (Agenda Item 3c)⁶

31. The Codex Secretariat drew the Committee's attention to CX/FH 13/45/4 Add.1, which provided information on relevant activities and standards of Sub-Committee 9 "Microbiology" of ISO/Technical Committee 34 "Food Products".

32. The Committee thanked ISO for the useful information.

⁵ CX/FH 13/45/4.

⁶ CX/FH 13/45/4 Add.1.

PROPOSED DRAFT GUIDELINES FOR CONTROL OF SPECIFIC ZOO NOTIC PARASITES IN MEAT: *TRICHINELLA* spp. AND *CYSTICERCUS BOVIS* (Agenda Item 4)⁷

33. The Committee recalled that at its 44th Session it had agreed to establish a physical working group, led by the European Union and New Zealand, to review the comments received at Step 3 and prepare proposals for the Plenary.

34. The Committee noted that due to time constraints the Working Group could only consider the document on *Trichinella* spp. in meat of Suidae (CRD 3) and that an in-session working group had considered the document on *Taenia saginata* in meat of domestic cattle and some outstanding issues of the document on *Trichinella* spp. (CRD 25).

35. The Committee considered the two documents separately.

***Trichinella* spp. in meat of Suidae**

36. The Delegation of the European Union introduced the revised proposed draft Guidelines for the Control of *Trichinella* spp. in meat of Suidae (CRD 3, Appendix 1) and explained that the physical working group had made several changes, additions or arrangements to improve the clarity of the document and that three paragraphs related to curing as a control measure (paragraph 24) and slaughterhouse surveillance (paragraphs 2 and 25) needed further reflection. The European Union also recalled that the in-session working group had prepared a proposal for the revision of Section 7.3 “Selection of risk-based control measures” (CRD 25, Appendix 2), which needed further discussion.

37. The Committee considered the revised proposed draft Guidelines section by section and, in addition to editorial corrections, made the following comments and amendments.

1. Introduction

38. The Delegation of the European Union recalled that the physical working group could not get to an agreement on the second paragraph and, in particular, on the second sentence, which linked post-slaughter control measures with negligible risk of infection in pigs. A number of delegations noted that the sentence was ambiguous, that it was not clear if “negligible risk” referred to the human or to the animal health risk and that the correlation between the risk to humans and the prevalence of *Trichinella* spp. in pigs needed to be clarified.

39. Noting that the main purpose of this introductory paragraph was to emphasize that post-slaughter control measures should be risk-based and that the correlations between the risk in human and the prevalence of *Trichinella* spp. in pigs were covered in Section 7.3 “Selection of risk-based control measures”, the Committee agreed to delete the second sentence.

7. Identification and selection of risk-based control measures

40. The Committee agreed to amend the title of Section 7 to read “Availability and Selection of risk-based control measures” to align with the titles of the sub-sections.

7.1 Availability of control measure at herd level

41. The Committee amended the paragraph to add a reference to the measures to establish a compartment of negligible risk, as described in Chapter 8.14 Infection with *Trichinella* spp. of the OIE Terrestrial Animal Health Code.

7.2 Availability of post-slaughter control measures

42. The Committee agreed to replace “cooking” with “heat treatment” in this section and throughout the document for consistency with the document on *Taenia saginata*. The Committee amended the last part of the paragraph to clarify that non-weaned pigs slaughtered below the age of 5 weeks might be derogated from post-slaughter control when relevant information (i.e. age and non-weaned status) can be verified by the competent authority.

⁷ CX/FH 13/45/5; comments of Argentina, Canada, Colombia, Costa Rica, Japan, USA and CLIMTRAVI (CX/FH 13/45/5-Add.1); comments of Kenya, AU and OIE (CX/FH 13/45/5-Add.2); comments of EU, Ghana and Kenya (CX/FH 13/45/5-Add.3); report of working group on control of specific zoonotic parasites in meat (CRD 3); Mali (CRD 9); Saint Lucia (CRD 10); Egypt (CRD 11); Dominican Republic (CRD 12); IACFO (CRD 13); El Salvador (CRD 14); Mongolia (CRD 15); Malaysia (CRD 17); Indonesia (CRD 21); report of in-session working group on control of specific zoonotic parasites in meat: *Taenia saginata* (CRD 25); proposal for revision of sections 7-9 of the proposed draft Guidelines for *Trichinella* spp. in meat of suids (CRD 26); proposal for revision of sections 7.3 and 9 of the proposed draft Guidelines for *Trichinella* spp. in meat of suids (CRD 27).

43. The Committee included a new paragraph on “curing” in this section to better differentiate curing from follow-up actions, i.e. freezing, heat treatment or irradiation which were dealt with in specific sub-sections and deleted Section 7.2.4. The new paragraph made specific reference to the recommendations of the International Commission on Trichinellosis (ICT) concerning inactivation of *Trichinella* spp. by curing. A footnote was also added to indicate that ICT is currently developing validated methods for curing.

7.2.1 Laboratory testing and follow-up actions

44. The Committee aligned the terminology related to laboratory testing with that of the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods* (CAC/GL 21 -1997).

7.3 Selection of risk-based control measures and 9 Monitoring and review

45. The Committee agreed to replace sections 7.3 and 9 with a proposal prepared by an informal group of countries (CRD 27) which differentiated and clarified the differences between the conditions for the establishment (7.3) and for the maintenance (9) of a compartment with negligible risk; the revised sections were also consistent with the risk management framework (RMF) approach described in paragraph 3 (i.e. preliminary risk management activities; identification and selection of risk management options; implementation of control measures; and monitoring and review).

46. The revised section 7.3 included a reference to the Joint FAO/WHO Expert meeting on risk-based examples for control of *Trichinella* spp. and *Taenia saginata/Cysticercus bovis*, which had provided examples to illustrate the linkages between slaughterhouse surveillance and the residual public health risk in the establishment of a negligible risk compartment.

47. The revised section 9 introduced more flexibility as to the options available for verifying maintenance of a compartment with negligible risk, which included:

- One option based on on-farm audits: (a) “conditions as described in Article 8.14.5 of the OIE Terrestrial Animal Health Code”;
- Two options based on slaughterhouse surveillance: (b) “a slaughter surveillance programme demonstrating that prevalence of infection does not exceed 1/1,000,000 pigs with at least 95% confidence” and (c) “a slaughter surveillance programme demonstrating an equivalent level of public health protection as in b above”; and
- A last option which combines on-farm audits and slaughter surveillance: (d) “a combination of audits of the herds and a slaughter surveillance program that provide an equivalent level of public health protection as in b above”.

11. Risk communication

48. The Committee amended the examples of heat treatment to refer to the core temperature recommended by ICT.

Conclusion

49. The Committee noted that substantial work and progress had been made on the document during the Session, which now provided more flexible guidance for the control of *Trichinella* spp. while ensuring consumer protection and facilitating international trade. Delegations supporting the adoption of the document noted that no specific technical issues had been raised and that the document was ready to progress in the Step procedure. They also noted that the new framework, which was established on scientific basis, did not impose more restrictive measures but rather provided more relaxation by allowing countries to derogate from the 100% testing requirements.

50. The Delegation of Costa Rica and other Latin American countries present at the Session emphasised that the documents used as the scientific basis to establish the proposed alternatives (in Sections 7.3 and 9) were not available for consideration by their technical experts. They were of the view that these documents should have been made available to those countries that had participated in the electronic working group. They also noted that earlier availability of these documents would have allowed their experts to familiarise themselves with the new RMF approach and advise the delegations attending the 45th CCFH, which were not experts on the subject, so that they could better understand the changes made to the document during the Session.

51. The Delegations of Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Honduras, Peru and Uruguay, in the spirit of compromise did not oppose the advancement of the proposed draft Guidelines in the Step process, but expressed their reservation to Sections 7.3 and 9 because: (i) the content (and not the structure) of these sections had substantially changed during the Session; (ii) the changes were based on scientific publications (e.g. Towards a Standardised surveillance for *Trichinella* in the European Union, L. Alban *et al.* 2011, Preventive Veterinary Medicine. v.99 (2–4):148-160) and risk assessments conducted by the FAO/WHO Expert Consultation, were not distributed in time so as to be examined by their national experts prior to the Session; and (iii) the proposed draft Guidelines included a reference (footnote 11 in paragraph 25) to FAO/WHO documents (i.e. Illustrations of the levels of public health protection that can be achieved when establishing a compartment with negligible risk) which were not currently available on the FAO and WHO websites nor had been made available during the Session.

52. The Representative of FAO, on behalf of FAO and WHO, informed the Committee that the full report on the development of risk-based examples would be available in January 2014.

53. Delegations supporting the adoption of the document offered to assist other countries to address their technical concerns on the innovative approach used in the document.

Request for advice from FAO/WHO

54. In view of the importance of the new RMF approach used in the document, the Committee supported the proposal of the Delegation of New Zealand to request FAO and WHO to continue working on the examples of parasites and, in particular, to:

- i. Further extend the work already done on illustrating the levels of public health protection that can be achieved when establishing a negligible risk compartment (Section 7.3 and 9), particularly as the current examples are highly conservative in some model inputs;
- ii. Develop examples to assist competent authorities in deciding on options for ongoing verification of a negligible risk compartment (“maintenance”) and for judging the equivalence of different options listed in Section 9 “Monitoring and Review”; and
- iii. Ensure a strong focus on communicating a risk-based approach to control of *Trichinella* spp. in pigs in an effective and easily understood manner in the scientific report.

55. The Representative of FAO, on behalf of FAO and WHO, welcomed the request for additional work to elaborate the maintenance section of the report and to provide information to make it a user-friendly document.

***Taenia saginata* in meat of domestic cattle**

56. The Delegation of New Zealand introduced the revised proposed draft Guidelines for the Control of *Taenia saginata* in meat of domestic cattle (CRD 25, Appendix 1) and explained that the in-session working group had made several changes, additions or arrangements to improve the clarity of the document. New Zealand noted that the working group had resolved most of the outstanding issues and that only a few issues remained to be discussed.

57. The Committee noted that the Guidelines had been amended to refer to *Taenia saginata* for both the cyst and the parasite (and no longer to *Cysticercus bovis* for the cyst) to reflect the most current expert advice.

58. The Committee considered the revised draft Guidelines section by section and, in addition to editorial corrections, made the following comments and amendments.

4. Definitions

59. The Committee amended the definition of “Herd”, which was based on the OIE definition, to delete the reference to congregations of gregarious wild animals, which was not relevant to the guidelines.

7.2.3 Treatment of meat

60. The Committee agreed to correct the reference to the heat treatment temperature in footnote 6 to more accurately reflect the WHO recommendation regarding routine preventative control which ensures lethality for *T. saginata* (i.e. core temperature of 60° C). The Committee also amended the second paragraph to indicate that salting and irradiation are further treatments for the control of *T. saginata* that should be validated before being approved by the competent authority.

7.3.1 Risk-based approach

61. The Committee noted that it was not possible to put a parameter to quantify the prevalence of infected animals as this was a judgement of the competent authority; in this context “low” and “high” were used as qualitative descriptors throughout the document.

8. Monitoring

62. The Committee amended the first sentence to allow more flexibility as to the use of histopathology following detection of suspected cysts at the slaughterhouse. The Committee deleted the last paragraph noting that traceability (trace back) from the slaughterhouse to the farm of carcasses positive for *T. saginata* was already dealt with in Section 7.2.4 “Traceability for slaughtered cattle”.

Conclusion

63. The Committee noted that there were no outstanding issues and, therefore, the document could be advanced for adoption.

Status of the Proposed Draft Guidelines for Control of Specific Zoonotic Parasites in Meat: *Trichinella* spp. and *Cysticercus bovis*

64. The Committee agreed to forward the proposed draft Guidelines for *Trichinella* spp. in meat of Suidae and the renamed proposed draft Guidelines for *Taenia saginata* in meat of domestic cattle to Step 5/8, with the omission of Steps 6 and 7, for adoption by the 37th Session of the Commission (Appendices III and IV).

PROPOSED DRAFT REVISION OF THE CODE OF HYGIENIC PRACTICE FOR SPICES AND DRIED AROMATIC HERBS (CAC/RCP 42-1995) (Agenda Item 5)⁸

65. The Committee recalled that the 44th Session had agreed to establish an electronic working group led by the United States of America and co-chaired by India, to redraft the *Code of Hygienic Practice for Spices and Dried Aromatic Herbs* taking into account the decisions taken at the Session, and the written comments submitted.

66. The Delegation of the United States of America introduced the report of the EWG, highlighting the key points taken into account in the redrafting of the Code and further drew the attention of the Committee to the points on which the EWG could not reach agreement (see paragraph 13 of CX/FH 13/45/13). The Delegation further informed the Committee that a revised proposal had been prepared which included changes resulting from written comments submitted for consideration by the Committee (CRD 20).

67. The Delegation also proposed to delete the Annex on the microbiological criterion, which had been held in square brackets awaiting information from FAO/WHO, because this information was not yet available.

68. The Committee agreed to base its discussion on CRD 20 and considered the proposed draft Code section by section. The Committee agreed with most of the proposals made in CRD 20 and in addition to editorial corrections, agreed to replace “official agency having jurisdiction” with “competent authority” throughout the document; and made the following comments and amendments.

Section II – Scope, Use and Definitions

69. In section 2.1, the Committee agreed to add fumigation as another example of post-harvest practices and in section 2.2, to retain the reference to the *General Standard for Contaminants and Toxins in Food and Feed* (CODEX STAN 193-1995) as relevant to the Code, in particular, in relation to mycotoxins.

3.2.1 Agricultural input requirements

70. The Committee agreed to amend the section on agricultural chemicals (3.2.1.4) to more clearly indicate that growers should only use agricultural chemicals according to the procedures authorised by competent authorities.

3.2.3.2 Health Status

71. The Committee agreed to amend this section to clarify that agricultural workers with symptoms of diarrhoea or food-transmissible, communicable diseases should be reassigned to duties that do not involve direct handling of food.

3.3.1 Prevention of cross-contamination

72. The Committee agreed to move the section on natural drying to a new section after 3.3.2 Storage and transport from the growing/harvest area to the packing establishment, and agreed to add a reference on mechanical drying as this form of drying was also applied at the primary production stage.

73. In addition, the Committee agreed to clarify that the reference to the *Code of Practice for the Reduction of Contamination of Food with Polycyclic Aromatic Hydrocarbons (PAH) from Smoking and Direct Drying Processes* related to the guidance with regard to the location of the drying area.

⁸ CX/FH 13/45/6; comments of Argentina, Bolivia, Chile, Costa Rica, Nicaragua, Philippines, AU, FoodDrinkEurope (CX/FH 13/45/6-Add.1); Ghana, India, Kenya, Thailand and Uruguay (CX/FH 13/45/6-Add.2); Mali (CRD 9); Saint Lucia (CRD 10); Egypt (CRD 11); Dominican Republic (CRD 12); IACFO (CRD 13); El Salvador (CRD 14); Malaysia (CRD 17); United States of America (CRD 20); Indonesia (CRD 21).

5.2.3 Microbiological and other specifications

74. The Committee agreed to also retain the more detailed guidance in this section regarding the specifications for pathogenic and toxigenic microorganisms, chemical residues, foreign material and decomposition.

5.7 Documentation and records

75. The Committee agreed to move the first paragraph in this section to a new section 5.8 Traceability/Product tracing and Recall Procedures, as it related more to traceability and was consistent with annexes in the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003).

Annex I – Microbiological Criteria for Spices and Dried Aromatic Herbs

76. The Committee agreed to delete this annex in view of the ongoing work of FAO/WHO and to reconsider the development of microbiological criteria once advice from FAO/WHO became available.

77. The Committee confirmed its earlier request concerning advice on the microbiological criterion for *Salmonella* to FAO/WHO (REP 13/FH, paragraphs 80-83). It was also agreed that the electronic working group on the code of hygienic practice for low-moisture foods (Agenda Item 6) would consider this advice and provide proposals for consideration by the Committee.

Conclusion

78. In view of the considerable progress made on the Code, the Committee agreed that it was ready for adoption. .

Status of the Proposed Draft Code of Hygienic Practice for Spices and Dried Aromatic Herbs

79. The Committee agreed to advance the renamed proposed draft Code of Hygienic Practice for Spices and Dried Aromatic Herbs to Step 5/8, with the omission of Steps 6 and 7, for adoption by the 37th Session of the Commission (Appendix V).

PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR LOW-MOISTURE FOODS (Agenda Item 6)⁹

80. The Committee recalled that the 44th Session agreed to request the 36th Session of the Commission to approve new work on the development of a Code of Hygienic Practice for Low-Moisture Foods and to establish an electronic working group, led by Canada and co-chaired by the United States of America, to develop the proposed draft Code for comments at Step 3 and consideration by the present Session. The Committee further recalled that the 44th CCFH agreed to request FAO and WHO to undertake work to provide the Committee with scientific advice on which low moisture food should be considered as the highest priorities for the Committee and the associated microbiological hazards and information relevant to the risk management of the microbiological hazards associated with the identified range of low-moisture foods.

81. The Delegation of Canada introduced the report of the electronic working group (CX/FH 13/45/7) and highlighted the objective of the EWG, the process followed and the key list of recommendations that needed consideration by the Committee.

82. The Delegation further informed the Committee that the scope needed to be defined, but that this would depend on the FAO/WHO report once it became available. It was also noted that, from the comments received, clarity was necessary on whether dried meats and fish should be considered as part of the document.

83. Since FAO/WHO were still in the process of undertaking the work in relation to the request from the Committee on low-moisture foods, the Committee agreed to focus its discussion on the recommendations of the EWG presented in paragraph 7 of CX/FH 13/45/7.

Decide if the Code of Hygienic Practice for Low-Moisture Foods will supplement or replace other applicable Codes included in Section 2.2

84. The Committee agreed to have one general document with possible annexes, noting that the development of annexes would depend on the advice of FAO/WHO. This approach was consistent with the approach taken in the development of other hygienic codes of practice and would ensure that there was limited duplication among different codes of practice.

Whether to include teas in the scope. Depending on the decision, the term spices and dried aromatic plants would be more appropriate to use if teas are included.

⁹ CX/FH 13/45/7; comments of Argentina, Australia, Bolivia, Colombia, Costa Rica, India, Jamaica, Japan, Mexico, Philippines, USA, FoodDrinkEurope, ICMSF, IDF (CX/FH 13/45/7-Add.1); EU and AU (CX/FH 13/45/7-Add.2); Ghana, India, Kenya and Thailand (CX/FH 13/45/7-Add.3); Mali (CRD 9); Dominican Republic (CRD 12); El Salvador (CRD 14); Malaysia (CRD 17); Republic of Korea (CRD 18); Egypt (CRD 22); Canada (CRD 23); FAO and WHO (CRD 24).

85. The Committee agreed to include teas in the scope, in particular because preparation of teas did not necessarily include a kill-step to inactivate *Salmonella* spp. and teas had been implicated in *Salmonella* spp. outbreaks. In view of this decision, it was agreed to use “spices and dried aromatic plants”.

86. The Committee further considered whether to include dried meat and dried fish. The Committee noted that, while the scope as proposed in the project document was not limiting, it would not be possible to include these products for the time-being as this would impact on the ability of FAO/WHO to provide their advice within the specified timeframes and would not be practical in the development of the Code at this stage.

Whether to develop the section on Primary production

87. The Committee agreed that a section on primary production should not be further developed as it would not be practical in view of the wide range of foods covered by the Code.

Whether to expand the validation section in Section 5.2.2

88. The Committee agreed that the reference to the *Guidelines for the Validation of Food Safety Control Measures* (CAC/GL 69-2008) provided sufficient guidance on validation, and that expansion of section 5.2.2 was not necessary.

Whether to include the microbiological criteria for *Salmonella* (Annex I) and whether criteria for other microorganisms should be considered / Whether to include *Salmonella* spp. and/or Enterobacteriaceae in the environmental monitoring programme (Annex II).

89. The Committee noted that a decision on criteria could not be taken at this time as the FAO/WHO were still in the process of responding to the request from the 44th Session of the Committee.

Request for advice from FAO/WHO

90. The Committee reconfirmed its request to FAO/WHO as agreed at the 44th Session of the Committee (REP13/FH, paragraphs 121-122) and to extend the request to include teas. The Committee also asked some clarification in terms of the source of dried protein products that had been associated with foodborne outbreaks.

91. In addition, the Committee agreed that FAO/WHO would consider the following criteria in the ranking of low-moisture foods:

- Prevalence of contamination of the pathogen in the specified food;
- Dose-response relationship as estimated by expert knowledge of the behaviour and physiology of the specific pathogen;
- Frequency and severity of disease;
- Size and scope of production;
- Diversity and complexity of the production chain and industry;
- Potential for amplification of foodborne pathogens through the food chain;
- Potential for control;
- Extent of international trade and economic impact.

92. The criteria would enable the identified commodities to be ranked into the following three priority groups: level 1 priorities, level 2 priorities and level 3 priorities.

Conclusion

93. The Committee agreed to establish an electronic working group, led by Canada and co-chaired by the United States of America, and working in English only, to prepare a revised proposed draft Code of Hygienic Practice for Low-moisture Foods taking into account the report of the FAO/WHO on low moisture foods when it became available. It was further agreed to establish a physical working group to meet immediately prior to the next session, led by Canada and United States of America, and working in English, French and Spanish to consider comments received and prepare proposals for consideration by the 46th Session of the Committee.

Status of the Proposed Draft Code of Hygienic Practice for Low-Moisture Foods

94. The Committee agreed to return the proposed draft Code of Hygienic Practice to Step 2 for redrafting by the electronic working group, circulation for comments at Step 3, and consideration by the aforementioned physical working group and at the next session of the Committee.

DISCUSSION PAPER ON OCCURRENCE AND CONTROL OF PARASITES (Agenda Item 7)¹⁰

95. The Committee noted that this item was considered by the Physical Working Group on CCFH Work Priorities and would be considered further under Agenda Item 9.

DISCUSSION PAPER ON THE NEED TO REVISE THE CODE OF HYGIENIC PRACTICE FOR FRESH FRUITS AND VEGETABLES (CAC/RCP 53-2003) (Agenda Item 8)¹¹

96. The Delegation of Brazil introduced CX/FH 13/45/9 and recalled the mandate received by the 44th Session of the Committee to review the *Code of Hygienic Practice for Fresh Fruits and Vegetables* and all its Annexes (CAC/RCP 53-2003) specifically with regard to eliminating duplication and redundancies and to identify provisions that might be missing from the Code. Brazil's work had prioritised the comparison between the main Code and the three Annexes for Fresh Leafy Vegetables, Melons and Berries; the comparison with the Annexes for Ready-to-Eat Fresh Pre-Cut Fruits and Vegetables and for Sprout Production was not performed.

97. The comparison, presented in Annex I of CX/FH 13/45/9, identified: (i) specificities of Fresh Leafy Vegetables, Melons and Berries; (ii) texts of the main Code which was repeated in the Annexes; and (iii) texts repeated/identical in two or more annexes. The comparison did not identify text repeated but not identical, i.e. similar in nature. Annex II of CX/FH 13/45/9 identified some inconsistencies in section headings and numbering.

98. Brazil stated that they intended to continue working on the document and present at the next session of the Committee a consolidated version of the Code.

99. The Committee supported the offer of Brazil and the proposal of the Chairperson to establish an electronic working group that would consider the consolidated document and identify any additional changes.

Conclusion

100. The Committee agreed to establish an electronic working group led by Brazil and co-chaired by France and working in English and French only, to review the consolidated Code and identify any additional changes for consideration at its next session. It was understood that if substantial changes were to be made to the Code (e.g. additional sections and provisions), the electronic working group would also prepare a project document for new work.

OTHER BUSINESS AND FUTURE WORK (Agenda Item 9)¹²**FORWARD WORKPLAN AND CRITERIA FOR EVALUATING AND PRIORITIZING NEW WORK (Agenda Item 9a) / NEW WORK (Agenda Item 9b)**

101. The Delegation of the Viet Nam, chair of the Working Group for Establishment of CCFH Work Priorities, which was held immediately before the present Session, introduced this Item and provided an overview of discussions and recommendations of the working group as presented in CRD 2.

102. The Delegation noted that the weighting values for the criteria for application to the Forward Workplan had been revised and that as a consequence, the approach in the application of the criteria and weightings for the prioritization had also been revised. The revised criteria were then used to develop the proposed Forward Workplan for the Committee.

103. The Committee considered the recommendations of the working group and took the following the decisions.

Guidelines for the Control of Nontyphoidal *Salmonella* spp. in Beef and Pork Meat

104. The Committee agreed to start new work on Guidelines for the Control of Nontyphoidal *Salmonella* spp. in Beef and Pork Meat.

105. Delegations recognising that verotoxigenic *E. coli* (VTEC) was an important pathogen in beef, but could not be included at this time in the scope of this new work, expressed their support for the inclusion of VTEC in beef in the Forward Workplan.

106. The Observer of OIE reiterated to the Committee that the OIE through its Animal Production Food Safety Working Group (APFSWG) had explored the feasibility of developing a standard for the control of *Salmonella* spp. in food-producing animals other than poultry at the farm level. The APFSWG had recommended that should Codex initiate new work on *Salmonella* spp. in pigs and cattle, the OIE should develop recommendations for the control of *Salmonella* spp. in pigs and cattle to address the pre-harvest management to complement the Codex guidelines.

¹⁰ CX/FH 13/45/8; comments of African Union (CRD 4); Ghana (CRD 5); Philippines (CRD 6); Thailand (CRD 8); Mali (CRD 9); Egypt (CRD 11); El Salvador (CRD 14); European Union (CRD 16).

¹¹ CX/FH 13/45/9; comments of African Union (CRD 4); Philippines (CRD 6); Thailand (CRD 8); Mali (CRD 9).

¹² Comments of Costa Rica, EU, Japan and USA (CX/FH 13/45/10); CX/FH 13/45/11; Report of the Physical Working Group on CCFH Work Priorities (CRD 2); African Union (CRD 4); Uruguay (CRD 7); Thailand (CRD 8); Mali (CRD 9).

Conclusion

107. The Committee agreed to submit the project document to the 37th Session of the Commission for approval as new work (Appendix VI). The Committee agreed to establish an electronic working group led by the United States of America and co-chaired by Denmark, and working in English only, to develop the proposed draft Guidelines for comment at Step 3 and consideration by its next session pending approval by the Commission.

108. The Committee noted that at this stage no scientific advice would be required from FAO and WHO, but that it was important for FAO and WHO to participate in the EWG in order to provide necessary information.

109. The Representative of FAO, speaking on behalf of FAO and WHO, emphasized that, should the Committee require scientific advice, it was important to consider that it takes an average of 18 to 24 months for FAO and WHO to deliver robust scientific advice and therefore this needed to be factored into the timelines for development of the Guidelines.

Guidelines on the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites

110. The Committee agreed to start new work on Guidelines for the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites.

Conclusion

111. The Committee agreed to submit the project document to the 37th Session of the Commission for approval as new work (Appendix VII).

112. The Committee agreed to establish:

- A physical working group, led by Japan and co-chaired by Canada, and working in English only, to discuss and prepare proposals for the structure and approach for the document, as well as for possible annexes (to be held in Japan in May/June 2014).
- An electronic working group, led by Japan and co-chaired by Canada, and working in English only, to develop the proposed draft Guidelines based on the proposals of the physical working group for comments at Step 3.
- A physical working group to meet immediately prior to the next Session, led by Japan and co-chaired by Canada and working in English, French and Spanish, to consider the comments submitted at Step 3 and prepare proposals for consideration by the next session.

Forward Workplan and Process by which the Committee on Food Hygiene (CCFH) will undertake its Work

113. The Committee agreed to the Forward Workplan (Appendix VIII). The Committee also agreed to the revised "Process by which the Committee on Food Hygiene (CCFH) will Undertake its Work", which included the criteria and weighting values to be applied when considering new work proposals and updating the Forward Workplan (Appendix IX).

Conclusion

114. In accordance with the process by which CCFH undertakes its work, the Committee agreed to:

- Request the Secretariat to issue a circular letter requesting proposals for new work.
- Establish the working group on CCFH work priorities, which will meet the day before the next session of the Committee and working in English, French and Spanish, chaired by the United States of America and co-chaired by Peru.
- Request the working group on CCFH work priorities to use the "criteria" on an experimental basis when considering new work proposals and to update the Forward Workplan.

Other matters

Revision of the *General Principles of Food Hygiene* and the Annex on HACCP

115. The Delegation of Finland informed the Committee of its intention to review the *General Principles for Food Hygiene* (CAC/RCP 1-1969) and the annex on HACCP for possible revision by the Committee. It was noted that the Principles was the basis for all codes of hygienic practice developed by CCFH, was widely used and referenced internationally and that there were several initiatives ongoing to update, in particular the concept of HACCP. Therefore, it was important for the Committee to retain ownership of the General Principles and the Annex on HACCP. In order to assist with this review, Finland planned to have a colloquium of scientists, regulators and other relevant stakeholders in the second quarter of 2014 to address areas for update and revision, e.g. guidance on validation, the application of HACCP to small and medium enterprises, and HACCP plan figure and tables.

116. The Delegation invited all interested parties to participate in this colloquium.

Committee on Spices and Culinary Herbs

117. The Delegation of India informed the Committee that the newly established Committee on Spices and Culinary Herbs (CCSCH) would be holding its first session on 11 – 14 February 2014, Kochi (Cochin), India and encouraged members to participate.

DATE AND PLACE OF THE NEXT SESSION (Agenda Item 10)

118. The Committee was informed that the 46th Session of the CCFH, which was tentatively scheduled from 17 – 21 November 2014, would be co-hosted by Peru. The exact time and venue would be determined by the host Governments in consultation with the Codex Secretariat.

SUMMARY STATUS OF WORK

| Subject Matter | Step | Action by: | Reference in REP14/FH |
|--|-------|---|------------------------------------|
| Amendments to the Definitions of the <i>Principles and Guidelines for the Conduct of Microbiological Risk Assessment</i> (CAC/GL 30-1999) | - | Governments 37 th CAC | Para. 10 and Appendix II |
| Proposed Draft Guidelines for the Control of <i>Trichinella</i> spp. in Meat of Suidae | 5/8 | Governments 37 th CAC | Para. 64 and Appendix III |
| Proposed Draft Guidelines for the Control of <i>Taenia saginata</i> in Meat of Domestic Cattle | 5/8 | Governments 37 th CAC | Para.64 and Appendix IV |
| Revised Proposed Draft <i>Code of Hygienic Practice for Spices and Dried Aromatic Herbs</i> (CAC/RCP 42-1995) | 5/8 | Governments 37 th CAC | Para. 79 and Appendix V |
| Annex on statistical and mathematical considerations to the <i>Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods</i> (CAC/GL 21-1997) | 2/3 | Electronic Working Group (Japan / Finland) 46 th CCFH | Para. 14 |
| Proposed Draft Code of Hygienic Practice for Low-Moisture Foods | 2/3 | Electronic Working Group / Physical Working Group (Canada / USA) 46 th CCFH | Para. 94 |
| New Work | | | |
| Guidelines for the Control of Nontyphoidal <i>Salmonella</i> spp. in Beef and Pork Meat | 1/2/3 | 37 th CAC Electronic Working Group (USA / Denmark) 46 th CCFH | Para. 107 and Appendix VI |
| Guidelines on the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites | 1/2/3 | 37 th CAC Physical Working Group/ Electronic Working Group/ Physical Working Group (Japan / Canada) 46 th CCFH | Para. 111 and Appendix VII |
| New work proposals / Forward Workplan | - | Governments Physical Working Group (USA / Peru) 46 th CCFH | Paras 113 – 114, and Appendix VIII |
| Discussion papers | | | |
| Discussion paper on the need to revise the <i>Code of Hygienic Practice for Fresh Fruits and Vegetables</i> (CAC/RCP 53-2003) | - | Electronic Working Group (Brazil / France) 46 th CCFH | Para. 100 |

Appendix I

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Appendix II**AMENDMENTS TO THE DEFINITIONS OF THE *PRINCIPLES AND GUIDELINES FOR THE CONDUCT OF MICROBIOLOGICAL RISK ASSESSMENT* (CAC/GL 30-1999)****(for adoption)****2. DEFINITIONS**

Hazard Characterization – The qualitative and/or quantitative evaluation of the nature of the adverse health effects associated with biological, chemical and physical agents, which may be present in food. ~~For chemical agents, a dose-response assessment should be performed. For biological or physical agents, a dose-response assessment should be performed if the data are obtainable.~~

Risk Communication – The interactive exchange of information and opinions throughout the risk analysis process concerning risk, risk-related factors and risk perceptions, among risk assessors, risk managers, consumers, industry, the academic community and other interested parties, including the explanation of risk assessment findings and the basis of risk management decisions.

Risk Estimate – The qualitative and/or quantitative estimation of risk resulting from risk characterization.

Risk Management – The process, distinct from risk assessment of weighing policy alternatives, in consultation with all interested parties, considering risk assessment and other factors relevant for the health protection of consumers and for the promotion of fair trade practices, and, if needed, selecting appropriate prevention and control options.

Appendix III**PROPOSED DRAFT GUIDELINES FOR THE CONTROL OF *TRICHINELLA* SPP. IN MEAT OF SUIDAE****(At Step 5/8)****1. Introduction**

1. Trichinellosis is a parasitic disease of major public health and economic importance in some countries. Human infection occurs from the consumption of raw or undercooked meat of many species (e.g. domestic pig, horse, game) containing infective *Trichinella* spp. larvae. Meat from animals of the family of Suidae (further referred to as "Suidae") is considered to be the most important means of transmission of *Trichinella* spp. to humans. The infection status of domestic pig populations is informed by knowledge of management practices and data from monitoring programs for live (serological survey) or slaughtered pigs. Human health data can also be used to support the determination of risk of exposure to *Trichinella* spp.

2. Post-slaughter control measures to protect consumers from exposure to *Trichinella* spp. in the meat of Suidae should be risk-based.

3. These Guidelines incorporate elements of the "risk management framework" (RMF) approach as developed by the Codex Committee on Food Hygiene for managing microbiological hazards (*Principles and Guidelines for the Conduct of Microbiological Risk Management* (CAC/GL 63-2007)) such as:

- Preliminary risk management activities;
- Identification and selection of risk management options;
- Implementation of control measures;
- Monitoring and review.

2. Objectives

4. The primary objective of these Guidelines is to provide guidance to governments and industry on risk-based control measures to prevent exposure of humans to *Trichinella* spp. in meat of Suidae.

5. The Guidelines provide a consistent and transparent technical basis for reviewing and implementing control measures based on epidemiological information and risk analysis. The risk-based control measures that are selected vary between countries and production systems. Measures applied at the national level should be taken into account in the judgement of equivalence¹ by importing countries, thereby facilitating international trade.

3. Scope and use of the Guidelines**3.1. Scope**

6. These Guidelines address only the control of *Trichinella* spp. in meat from Suidae as this is considered the most important source of infection of humans. The control of *Trichinella* spp. in meat from other species (e.g. horses, bears, walrus, etc.) should however be taken into account where considered relevant to the control of *Trichinella* spp. in meat from Suidae.

7. These Guidelines apply to the control of all species and genotypes of *Trichinella* that may infect Suidae and cause foodborne disease. The Guidelines are based on the *Working Principles for Risk Analysis for Application in the Framework of the Codex Alimentarius*² and the *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005) that provides generic advice on a risk-based approach to meat hygiene.

8. These Guidelines used in conjunction with the OIE recommendations (*Chapter 8.14 Infection with Trichinella* spp. of the OIE Terrestrial Animal Health Code), apply to all steps from primary production to consumption.

3.2. Use

9. These Guidelines, used in conjunction with the OIE recommendations (*Chapter 8.14 Infection with Trichinella* spp. of the OIE Terrestrial Animal Health Code), provide specific guidance for control of *Trichinella* in meat of Suidae with potential control measures being considered at each step, or group of steps, in the food chain. The Guidelines are supplementary to and should be used in conjunction with the *General Principles of Food Hygiene* (CAC/RCP 1-1969), the *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005), the *Code of Practice for the Processing and Handling of Quick Frozen Foods* (CAC/RCP 8-1976), the FAO/WHO/OIE *Guidelines for the Surveillance, Management, Prevention and Control of Trichinellosis*³ and the *Recommendations on Methods for the Control of Trichinella in Domestic and Wild Animals Intended for Human Consumption* prepared by the

¹ *Guidelines on the Judgement of Equivalence Sanitary Measures associated with Food Inspection and Certification Systems* (CAC/GL 53-2003)

² <http://www.fao.org/DOCREP/006/Y4800E/y4800e0o.htm>

³ http://www.trichinellosis.org/uploads/FAO-WHO-OIE_Guidelines.pdf

International Commission on Trichinellosis (ICT) Standards for Control Guidelines Committee⁴.

10. The diagnostic techniques referred to in these Guidelines are those of the *OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (Chapter 2.1.16 Trichinellosis)*.

11. Flexibility in application is an essential element of these Guidelines. They are primarily intended for use by government risk managers and industry in the design and implementation of food control systems. These Guidelines could also be used when judging the equivalence⁵ of different food safety measures for meat of Suidae in different countries for international trade purposes.

12. These Guidelines provide a framework for decisions regarding post-slaughter control measures to protect humans from consumption of meat of Suidae which may be infected with *Trichinella* spp. Pre-harvest preventative measures, prerequisite criteria and conditions for recognition of compartments of domestic pigs as negligible risk are described in *Chapter 8.14 Infection with Trichinella* spp of the OIE Terrestrial Animal Health Code.

4. Definitions

- 13.
- | | |
|---------------------------------------|--|
| Compartment⁶ | means an animal subpopulation contained in one or more establishments under a common biosecurity management system with a distinct health status with respect to a specific disease or specific diseases for which required surveillance, control and biosecurity measures have been applied for the purpose of international trade. |
| Cross breeds | means the progeny of domestic pigs with non-domesticated animals of the family Suidae. |
| Domestic pigs | means domesticated animals of the family Suidae living in a managed production system. |
| Feral pigs | means an animal of a domesticated species of the family Suidae that now lives without direct human supervision or control. |
| Finishing pigs | means domestic pigs kept solely for meat production. |
| Reservoir wildlife⁶ | means feral animals, captive wild animals and wild animals that are known to be the most important potential direct or indirect sources of infection for <i>Trichinella</i> spp. to domestic pigs in a region or country. |

5. Principles applied to control of *Trichinella* spp. in meat of Suidae

14. Overarching principles for good hygienic practice for meat are presented in the *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005) section 4: *General Principles of Meat Hygiene*. Three principles that have particularly been taken into account in these Guidelines are:

- i. The principles of food safety risk analysis should be incorporated wherever possible and appropriate in the design and implementation of meat hygiene programmes.
- ii. As appropriate to the circumstances, the results of monitoring and surveillance of animal and human populations should be considered with subsequent review and/or modification of meat hygiene requirements whenever necessary.
- iii. Competent authorities should recognise the equivalence of alternative hygiene control measures where appropriate, and promulgate meat hygiene measures that achieve required outcomes in terms of safety and suitability and facilitate fair practices in the trading of meat.

6. Preliminary risk management activities

15. Consumers are exposed to the risk of *Trichinella* spp. infection when they consume meat containing infectious larvae. Risk management activities should incorporate a “primary production-to-consumption” approach in order to identify all steps in the food-chain where control measures are required.

16. Preliminary risk management activities appropriate to these Guidelines include:

- Development of a national, regional, or compartment risk profile noting that a generic risk profile which takes into account the FAO/WHO/OIE Guidelines for the Surveillance, Management, Prevention and

⁴ (<http://www.med.unipi.it/ict/ICT%20Recommendations%20for%20Control.English.pdf>)

⁵ *Guidelines on the Judgement of Equivalence Sanitary Measures associated with Food Inspection and Certification Systems* (CAC/GL 53-2003)

⁶ Definition in the OIE Terrestrial Animal Health Code.

Control of *Trichinellosis* ("FAO/WHO/OIE Guidelines *Trichinella*") has been published on the FAO⁷ and WHO⁸ websites.

- Evaluation of the epidemiological evidence supporting a negligible risk claim for domestic pigs consumed domestically or abroad.

7. Availability and selection of risk-based control measures

7.1 Availability of control measures at herd level

17. Measures to prevent *Trichinella* infection in domestic pig herds and to establish a compartment of negligible risk are described in Chapter 8.14 *Infection with Trichinella* spp. of the OIE Terrestrial Animal Health Code.

7.2 Availability of post-slaughter control measures

18. Post-slaughter control measures for *Trichinella* spp. include: laboratory testing and follow-up actions, freezing and heat treatment. Irradiation of meat of Suidae is also an option to destroy *Trichinella* spp. in meat prior to consumption. Control measures should be validated and then be approved by the competent authority, as appropriate. Non-weaned pigs slaughtered below the age of 5 weeks may be derogated from post-slaughter control measures⁹ when there is relevant information that can be verified by the competent authority.

19. Inactivation of *Trichinella* spp. by curing should follow the recommendations of ICT¹⁰.

7.2.1 Laboratory testing and follow-up actions

20. When laboratory tests are performed on individual carcasses, those selected analytical methods should be in accordance with the diagnostic techniques recommended in Chapter 2.1.16. *Trichinellosis* of the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (digestion assays) and the ICT Recommendations for Quality Assurance in Digestion Testing Programmes for *Trichinella*¹¹ or ISO/CEN standards.

21. Any analytical method that is selected should have known performance characteristics, i.e. sensitivity and specificity, if a risk-based approach to ensuring food safety is to be applied.

22. If a *Trichinella*-positive carcass is identified during post-slaughter testing, the competent authority should be notified. The competent authority can then decide which follow-up actions are necessary including possible disposal of the carcass.

7.2.2 Freezing

23. Freezing of meat should utilise cooling regime parameters that ensure lethality for all *Trichinella* spp. present in different portions of meat or whole carcasses. Use of this method for inactivation of *Trichinella* spp. that are not cold tolerant should be in accordance with validated parameters such as those described in the "Recommendations on Methods for the Control of *Trichinella* in Domestic and Wild Animals Intended for Human Consumption" prepared by the ICT Standards for Control Guidelines. Freezing should not be used as a control measure in regions where *Trichinella* species and genotypes that are known to be cold tolerant such as *Trichinella* T6, *T. britovi*, and *T. nativa*, are endemic.

7.2.3 Heat treatment or irradiation

24. Inactivation of *Trichinella* spp. by these methods should be performed in accordance with validated methods such as those described in the "Recommendations on Methods for the Control of *Trichinella* in Domestic and Wild Animals Intended for Human Consumption" prepared by the ICT Standards for Control Guidelines Committee. Guidance on irradiation is given in the General Standard on Irradiated Food (CODEX STAN 106-1983) and the Code of Practice for Radiation Processing of Food (CAC/RCP 19-1979).

7.3. Selection of risk-based control measures

25. Following the establishment of the compartment with negligible risk as described in Chapter 8.14 *Infection with Trichinella* spp. of the OIE Terrestrial Animal Health Code and after determining the level of public health protection, the competent authority may provide derogation from specific post-slaughter controls or change the level of application of specific post-slaughter controls.

26. Illustrations of the levels of public health protection that can be achieved when establishing a compartment with negligible risk are provided by FAO⁷ and WHO⁸.

⁷ <http://www.fao.org/food/food-safety-quality/a-z-index/foodborne-parasites/en/>

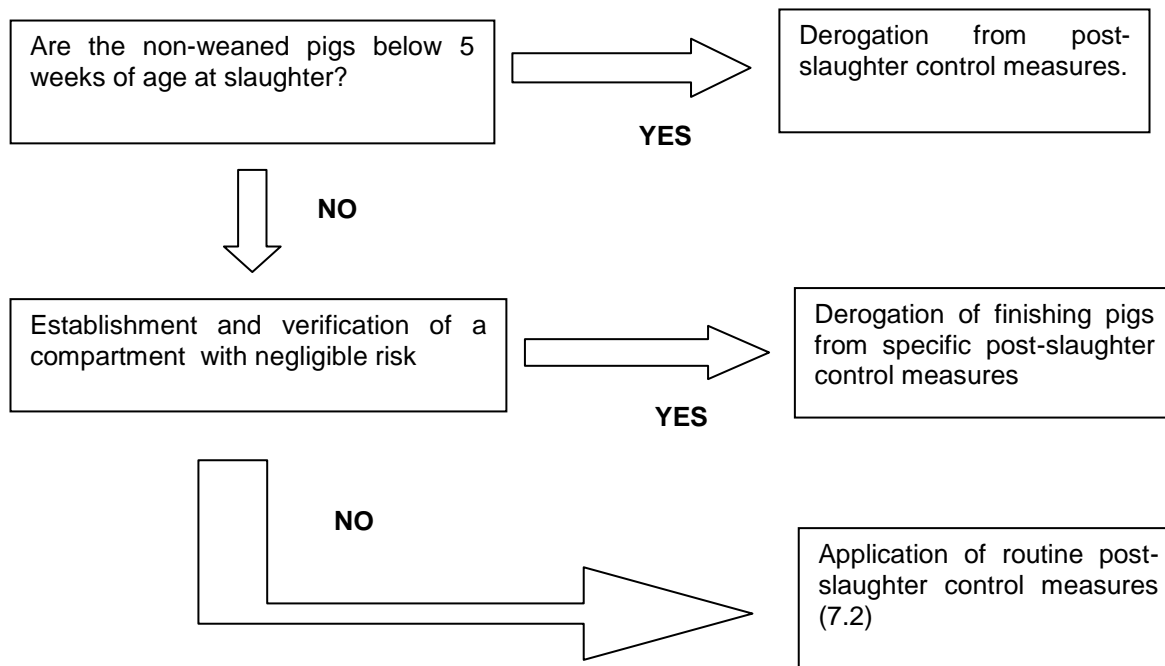
⁸ <http://www.who.int/foodsafety/micro/jemra/assessment/parasites/en/>

⁹ http://www.aesan.msssi.gob.es/AESAN/docs/docs/evaluacion_riesgos/comite_cientifico/ingles/TRICHINELLA_SUCKLING_PIG.pdf

¹⁰ Validated methods for curing are current under development by ICT

¹¹ http://www.trichinellosis.org/uploads/Part_1_final_-_QA_Recomendations_7Feb2012.pdf

27. An example decision pathway for selection of specific post-slaughter control measures for domestic pigs is illustrated below:



8. Implementation of risk-based measures

28. Implementation of selected control measures is dependent on official recognition by the competent authority of the *Trichinella* status of the compartment.

9. Monitoring and review

29. After determining the level of health protection, on-going verification of a compartment with negligible risk by the competent authority should be based on:

- a. Conditions as described in Article 8.14.5 of the OIE Terrestrial Animal Health Code; or
- b. A slaughter surveillance programme demonstrating that prevalence of infection does not exceed 1/1,000,000 pigs with at least 95% confidence; or
- c. A slaughter surveillance programme demonstrating an equivalent level of public health protection as in b above; or
- d. A combination of audits of the herds and a slaughter surveillance program that provide an equivalent level of public health protection as in b above.

10. Non-domesticated Suidae, feral pigs and cross-breeds

30. All meat derived from non-domesticated Suidae, including wild boars, feral pigs and cross-breeds intended for human consumption should come from animals:

- a. tested in accordance with the diagnostic techniques recommended in the OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* (digestion assays); or
- b. be processed to ensure the inactivation of *Trichinella* spp. in accordance with one of the methods in section 7.2, validated and approved for post-slaughter control in these animals.

31. Positive carcasses should be disposed of according to recommendations of the competent authority.

11. Risk communication

32. Best practice in the control of *Trichinella* spp. in the meat of Suidae should be communicated to all stakeholders in domestic pig production. Similarly, all stakeholders should be aware of the benefits of obtaining *Trichinella* negligible risk compartment status.

33. Hunters should be informed on the risk of consumption of meat from reservoir wildlife, stressing the importance of testing even if for personal consumption or the need to properly cook any meat from wild game (e.g. a core temperature of at least 71°C as recommended by ICT). Hunters should be also informed of the risk of promulgating and maintaining the sylvatic life cycle associated with the common habit of leaving animal carcasses in the field after skinning, or removing and discarding the entrails, thereby providing the opportunity for transmission to new hosts.

34. Communication procedures on the occurrence of *Trichinella* infections should be established between the veterinary authority and the public health authority. The competent authority should ideally publish annual laboratory results in a form that demonstrates the epidemiological status of herds, compartments, regions or the whole country. Results of epidemiological investigations of any food-borne outbreaks should also be communicated.

35. Since each country has specific consumption habits, communication programs pertaining to trichinellosis are most effective when established by individual governments.

36. Retailers and consumers, including people who visit regions or countries where *Trichinella* is endemic, should be made aware that meat should be fully cooked e.g. a core temperature of at least 71°C as recommended by ICT in order to avoid becoming sick from consuming meat contaminated with parasites.

Appendix IV**PROPOSED DRAFT GUIDELINES FOR THE CONTROL OF *TAENIA SAGINATA* IN MEAT OF DOMESTIC CATTLE****(At Step 5/8)****1. Introduction**

1. Bovine cysticercosis refers to the infection of the striated muscle of cattle with the metacestode (e.g. cysticerci) of *Taenia saginata*, traditionally referred to as "*Cysticercus bovis*". Humans acquire the infection (taeniasis or beef tapeworm infection) solely from consumption of raw or undercooked beef containing live cysticerci. Taeniasis in human populations varies worldwide with a high prevalence in some countries. Very few countries are free from *T. saginata*. Bovine cysticercosis is not a condition notifiable to the OIE and is regulated in some countries.

2. The public health significance of *T. saginata* is limited due to the mostly benign clinical symptoms (or asymptomatic forms illustrated in the global ranking of foodborne parasites using a multicriteria ranking tool for scoring parasites based on public health criteria only during the FAO/WHO expert meeting on Foodborne Parasites – Multicriteria based ranking for risk management (Annex 5, Figure 2 of the report¹). However, the economic importance is high for several reasons:

- Resources involved in routine meat inspection
- Downgrading and condemnation of affected carcasses (or routine treatment to inactivate cysticerci such as freezing or cooking)
- Intensified livestock controls at farm level when affected herds are identified.

3. As governments review their meat hygiene systems, non-risk based control measures for meat and meat products in trade can be disproportionate to the level of risk reduction achieved.

4. Where the parasite is common in domestic cattle, mitigation of risks to consumers is hampered by the low sensitivity of routine post mortem meat inspection.

5. These Guidelines incorporate elements of a risk management framework (RMF) approach as developed by the Codex Committee on Food Hygiene for managing microbiological hazards (*Principles and Guidelines for the Conduct of Microbiological Risk Management* (CAC/GL 63-2007)) i.e.:

- Preliminary risk management activities
- Identification and selection of risk management options
- Implementation of control measures
- Monitoring and review.

2. Objectives

6. The primary objective of these Guidelines is to provide guidance to governments and industry on risk-based measures for the control of *T. saginata* in meat of domestic cattle.

7. These Guidelines also provide a consistent and transparent technical basis for reviewing national or regional control measures based on epidemiological information and risk analysis. These Guidelines should be taken into account in the judgement of equivalence by importing countries where such measures differ from their own, thereby facilitating international trade².

3. Scope and use of the Guidelines**3.1. Scope**

8. These Guidelines, used in conjunction with *FAO/WHO/OIE Guidelines for the Surveillance, Prevention and Control of Taeniasis/Cysticercosis*³ ("*FAO/WHO/OIE Guidelines Taeniasis*") address the control of cysticercosis in the meat of domestic cattle that may cause human taeniasis. They are based on the *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005) that provides generic advice on a risk-based approach to meat hygiene.

9. These Guidelines, used in conjunction with the *FAO/WHO/OIE Guidelines Taeniasis*, apply to all steps in a "primary production-to-consumption" food chain continuum.

¹ <http://www.fao.org/food/food-safety-quality/a-z-index/foodborne-parasites/en>

² *Guidelines on the Judgement of Equivalence Sanitary Measures associated with Food Inspection and Certification Systems* (CAC/GL 53-2003)

³ *FAO/WHO/OIE Guidelines for the Surveillance, Prevention and Control of Taeniasis/Cysticercosis* (www.oie.int/doc/ged/d11245.pdf)

3.2. Use

10. These Guidelines provide specific guidance for control of cysticercosis in meat according to a risk-based approach to selection of post-harvest control measures as risk management options. The Guidelines are supplementary to and should be used in conjunction with the *General Principles of Food Hygiene* (CAC/RCP 1–1969), the *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005) and the *FAO/WHO/OIE Guidelines on Taeniasis*.

11. The diagnostic techniques referred to in the Guidelines are those of the *OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animal*.

12. Provision of flexibility in application of the Guidelines is an important attribute. They are primarily intended for use by government risk managers and industry in the design and implementation of food control systems. The Guidelines could also be used when judging the equivalence of different control measures for beef meat in different countries.

4. Definitions

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Domestic cattle mean all domesticated cattle species, including *Bos taurus* and *B. indicus*, banteng (*Bos javanicus*), gayal (*Bos frontalis*), and yaks (*Bos grunniens*), and additionally all *Bubalus* and *Bison* species.

Herd means a number of animals of one kind kept together under human control.

5. Principles applying to control of bovine cysticercosis

14. Overarching principles for good hygienic practice for meat are presented in the *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005) section 4: *General Principles of Meat Hygiene*. Three principles that have particularly been taken into account in these Guidelines are:

- i. The principles of food safety risk analysis should be incorporated in the design and implementation of meat hygiene programmes wherever possible and appropriate.
- ii. As appropriate to the circumstances, the results of monitoring of slaughter populations and surveillance of human populations should be considered when reviewing or modifying meat hygiene requirements
- iii. Competent authorities should recognise the equivalence of alternative hygiene measures where appropriate, and promulgate meat hygiene measures that achieve required outcomes in terms of safety and suitability and facilitate fair practices in the trading of meat.

6. Preliminary risk management activities

6.1 Identification of a food safety issue

15. Preliminary risk management activities appropriate to these Guidelines include:

- Development of a national or regional level risk profile taking into account the generic Codex risk profile; and
- Evaluation of the epidemiological evidence supporting a risk-based approach relative to the national or regional situation or trade in meat.

6.2 Risk Profile

16. Risk profiles provide a collation of scientific information that guides risk managers and industry in taking further actions as part of applying a RMF approach to a food safety issue. Both risk profiles and risk assessment can assist in the design of food control systems that are tailor-made to individual food production and processing systems. A generic risk profile is available on the repository of risk profiles on the FAO⁴ and WHO⁵ websites.

17. Epidemiological evidence to support decisions on appropriate control measures to be applied can be gathered from a range of sources. For example, both industry and governments may have historical records on test results from slaughter populations and farm investigations. Human health surveillance and treatment data, where available, are useful in assessing any residual risks that may exist in different regions or countries.

7. Identification, selection and implementation of risk-based control measures

7.1. Control measures at farm level

18. These Guidelines should be applied in conjunction with the FAO/WHO/OIE Guidelines on Taeniasis, regarding selection and application of control measures. These control measures cover all steps of the "primary production-

⁴ <http://www.fao.org/food/food-safety-quality/a-z-index/foodborne-parasites/en/>

⁵ <http://www.who.int/foodsafety/micro/jemra/assessment/parasites/en/>

to-consumption" food chain continuum.

7.2 Post-slaughter control measures

7.2.1. Post mortem inspection

19. Routine post-slaughter control measures for *T. saginata* are essentially limited to meat inspection. Where necessary and practicable, a sample of suspect cysts should be confirmed by histopathology (identification of cysts that are viable) according to validated techniques acceptable to the national competent authority.

20. Any laboratory-based test should have known performance characteristics, i.e. sensitivity and specificity if a risk-based approach to ensuring food safety is to be applied. The sensitivity of routine post mortem meat inspection for *T. saginata* is very low, particularly in lightly infected animals, and this means a significant proportion of individual carcasses containing *T. saginata* cysts will pass undetected. Only a proportion of undetected cysts will be viable and this proportion depends on the extent and cycle of infection in the herd of origin.

21. The range and intensity of post mortem inspection procedures varies from country to country.

7.2.2. Alternative inspection procedures

22. When a suspect carcass or part is identified during routine inspection procedures, additional inspection of the suspect carcass and its parts and cohorts can increase the sensitivity of inspection for identifying infected parts and/or further infected carcasses. The range and intensity of alternative post mortem inspection procedures varies from country to country.

7.2.3. Treatment of meat

23. Temperature treatment (heating and freezing) at regimes that ensure lethality for *T. saginata* is an available routine preventative control measure⁶. Heat treatment is also used for meat from suspect or confirmed *T. saginata* carcasses and carcasses from the same herd. Such treatments should be validated according to national guidelines.

24. Salting and irradiation are further treatments that may be available provided the treatment has been validated and has been approved by the competent authority to ensure the lethality of *T. saginata*. Guidance on irradiation is given in the *General Standard on Irradiated Food* (CODEX STAN 106-1983) and the *Code of Practice for Radiation Processing of Food* (CAC/RCP 19-1979).

7.2.4. Traceability for slaughtered cattle

25. Traceability of cattle between slaughterhouse and place of production should be in place so that information on carcasses positive for *T. saginata* can be utilised for application of control measures at farm level (and elsewhere) when deemed appropriate by the competent authority. This may include notification of "suspect" cohorts of animals sent to the slaughterhouse for application of intensified post mortem inspection procedures.

7.2.5. Movement control and surveillance

26. The competent authority may apply movement control requirements to herds where they judge from monitoring information that this is an appropriate risk-based measure.

7.3. Selection of risk-based control measures

7.3.1. Risk-based approach

27. Slaughter populations may be regarded as being of low prevalence if the following conditions are met:

- Slaughterhouse information demonstrating the absence of, or a low prevalence of, suspect cysts in the meat of the slaughtered population over time; or
- If available, public health data demonstrating that human infection attributable to the domestic slaughter population is absent or very rare;
- Other epidemiological data as relevant.

28. In such circumstances, risk modelling can be used to demonstrate that derogation from some routine post mortem inspection procedures and/or reduction in the intensity of some routine post mortem inspection procedures (palpation and/or incision) would have negligible impact on the level of consumer protection afforded by traditional and highly intensive procedures. Where this situation occurs, the competent authority should apply risk-based post mortem inspection derogations as appropriate.

29. Examples of levels of consumer protection provided by different levels of post mortem inspection for slaughter populations were modelled for low and high prevalence populations by FAO⁴ and WHO⁵.

⁶ Temperatures of -10 °C for no less than 10 days or heating to a core temperature of 60 °C have been recommended (WHO 1995. Food Technologies and Public Health. www.who.int/entity/foodsafety/publications/fs_management/en/foodtech.pdf)

30. Intensified post mortem procedures applied to an individual carcass when a suspect cyst is detected, and further post mortem inspection procedures applied to a related group of carcasses should also be considered according to the characteristics of infection in the slaughter population and the likelihood of reduction of risks to the consumer.

31. Episodes of cysticercosis can occur regardless of the available information on past history. Incursions can occur, and occasionally do, from sources out of the country, including via contaminated feed and infected people.

8. Monitoring and review

32. A robust system for monitoring of data obtained at slaughterhouse level by both organoleptic post-mortem inspection and histopathology, where practicable, should be in place. This system should provide for evaluation of the performance of the selected control measures relative to the level of consumer protection that is sought and may include:

- Collection and evaluation of slaughterhouse information as well as related laboratory reports (e.g. histopathology);
- Trace back to the farm when suspect cysts are found in the slaughterhouse and application of on-farm controls and more intensive slaughterhouse inspection if required by the competent authority;
- Notification of results of intensified inspection to the competent authority;
- Involving public health authorities.

9. Risk communication

33. Best practice in the control of *T. saginata* in the meat of domestic cattle should be communicated to all stakeholders in cattle production.

34. All persons involved in cattle production should receive basic public health awareness training on the life cycle of the parasite and how humans may pose a risk as a source of infection to the cattle.

35. The competent authority should make appropriate information (e.g. monitoring, investigation information) publicly available where possible when there is a public health risk and conduct public education campaigns as appropriate.

Appendix V**PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR SPICES AND DRIED AROMATIC HERBS
(CAC/RCP 42 – 1995)****(At Step 5/8)****INTRODUCTION**

1. Dried, fragrant, aromatic or pungent, edible plant substances, in the whole, broken or ground form, e.g. spices and dried aromatic herbs, impart flavour, aroma or colour when added to food. Spices and dried aromatic herbs may include many parts of the plant, such as aril, bark, berries, buds, bulbs, leaves, rhizomes, roots, seeds, stigmas, pods, resins, fruits, or plant tops.

2. The production, processing, and packing of spices and dried aromatic herbs is very complex. For example, source plants for spices and dried aromatic herbs are grown in a wide range of countries and on many types of farms, e.g. from very small farms to, in rare instances, large farms. Agricultural practices for growing source plants for spices and dried aromatic herbs also vary tremendously from virtually no mechanization to highly mechanized practices. Drying of source plants may be performed mechanically (for rapid drying) or naturally (e.g. slower drying under the sun for several days). The distribution and processing chain for spices and dried aromatic herbs is also highly complex and can span long periods of time and include a wide range of establishments. For example, spices and dried aromatic herbs grown on small farms may pass through multiple stages of collection and consolidation before reaching a spice processor and packer or a food manufacturer. Dried product processing generally involves cleaning (e.g. culling, sorting to remove debris), grading, sometimes soaking, slicing, drying, and on occasion grinding/cracking. Some spices and dried aromatic herbs are also treated to mitigate microbial contamination, typically by steam treatment, gas treatment (e.g. ethylene oxide), or irradiation. Processing and packing/repacking may also take place in multiple locations over long periods of time, since spices and dried aromatic herbs are prepared for different purposes.

3. The safety of spices and dried aromatic herbs products depends on maintaining good hygienic practices along the food chain during primary production, processing, packing, retail, and at the point of consumption. Sporeforming bacteria, including pathogens such as *Bacillus cereus*, *Clostridium perfringens*, and *Clostridium botulinum*, as well as non-sporeforming vegetative cells of microorganisms such as *Escherichia coli*, *Staphylococcus aureus*, and *Salmonella* spp. have been found in spices and dried aromatic herbs. There have been a number of outbreaks of illness associated with spice and seasoning consumption, with most being caused by *Salmonella* spp. that have raised concerns regarding the safety of spices and dried aromatic herbs. The complex supply chain for spices and dried aromatic herbs makes it difficult to identify the points in the food chain where contamination occurs, but evidence has demonstrated that contamination can occur throughout the food chain if proper practices are not followed.

4. The safety of spices and dried aromatic herbs can also be affected by mycotoxin-producing moulds, e.g. those producing aflatoxin (such as *Aspergillus flavus* or *Aspergillus parasiticus*) or ochratoxin A (such as *Aspergillus ochraceus*, *Aspergillus carbonarius*, or *Penicillium verrucosum*). Chemical hazards such as heavy metals and pesticides, as well as physical contaminants such as stones, glass, wire, extraneous matter and other objectionable material, may also be present in spices and dried aromatic herbs.

SECTION I – OBJECTIVES

5. This Code of Hygienic Practice addresses Good Agricultural Practices (GAPs) and Good Manufacturing Practices (GMPs) that will help minimize contamination, including microbial, chemical and physical hazards, associated with all stages of the production of spices and dried aromatic herbs from primary production to consumer use. Particular attention is given to minimizing microbial hazards.

SECTION II - SCOPE, USE AND DEFINITION**2.1 Scope**

6. This Code applies to spices and dried aromatic herbs - whole, broken, ground or blended. Spices and dried aromatic herbs may include the dried aril (e.g. the mace of nutmeg), bark (e.g. cinnamon), berries (e.g. black pepper), buds (e.g. clove), bulbs (e.g. dried garlic), leaves (e.g. dried basil), rhizomes (e.g. ginger, turmeric), seeds (e.g. mustard), stigmas (e.g. saffron), pods (e.g. vanilla), resins (e.g. asafoetida), fruits (e.g. dried chilli) or plant tops (e.g. dried chives). It covers the minimum requirements of hygiene for growing, harvesting and post-harvest practices (e.g. curing, bleaching, blanching, cutting, drying, cleaning, grading, packing, transportation and storage, including disinfestation and fumigation) processing establishment, processing technology and practices (e.g. grinding, blending, freezing and freeze-drying, treatments to reduce the microbial load) packaging and storage of processed products. For spices and aromatic herbs collected from the wild, only the measures for handling and post-harvest activities (i.e. from section 3.2.3 onward) apply.

2.2 Use

7. This Code follows the format of the *General Principles of Food Hygiene* (CAC/RCP 1-1969) and should be used in conjunction with it and other applicable codes such as the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003) and the *General Standard for Contaminants and Toxins in Food and Feed* (CODEX STAN 193-1995).

8. This Code is a recommendation to which producers in different countries should adhere as far as possible taking into account the local conditions while ensuring the safety of their products in all circumstances. Flexibility in the application of certain requirements of the primary production of spices and dried aromatic herbs can be exercised, where necessary, provided that the product will be subjected to control measures sufficient to obtain a safe product.

2.3 Definitions

9. Refer to definitions in the *General Principles of Food Hygiene* (CAC/RCP 1-1969) and the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003). In addition, the following expressions have the meaning stated:

10. **Spices and Dried Aromatic Herbs** – dried components or mixtures of dried plants used in foods for flavouring, colouring, and imparting aroma. This term equally applies to whole, broken, ground and blended forms.

11. **Disinfest** – to eliminate harmful, threatening, or obnoxious pests, e.g. vermin

12. **Microbial Reduction Treatment** – process applied to spices and dried aromatic herbs to eliminate or reduce microbial contaminants to an acceptable level.

13. **Source Plant** – plant (non-dried) from which the spice or dried aromatic herb is derived.

SECTION III - PRIMARY PRODUCTION

3.1 Environmental Hygiene

14. Source plants for spices and dried aromatic herbs should be protected, to the extent practicable, from contamination by human, animal, domestic, industrial and agricultural wastes which may be present at levels likely to be a risk to health. Adequate precautions should be taken to ensure that these wastes are disposed of in a manner that will not contaminate plants and constitute a health hazard to consumers of the final product.

3.1.1 Location of the production site

15. The proximity of production sites that pose a high risk for contamination of source plants, such as animal production facilities, hazardous waste sites and waste treatment facilities, should be evaluated for the potential to contaminate production fields for source plants for spices and dried aromatic herbs with microbial or other environmental hazards.

16. Consideration of production site location should include an evaluation of the slope and the potential for runoff from nearby fields, the flood risk as well as hydrological features of nearby sites in relation to the production site.

17. When the environmental assessment of the site of production identifies a potential food safety risk, measures should be implemented to prevent or minimize contamination of source plants for spices and dried aromatic herbs at the production site.

3.1.2 Wild and domestic animals and human activity

18. Many wild and domestic animal species and humans that may be present in the production environment are known to be potential sources of foodborne pathogens. Domestic and wild animals and human activity can present a risk both from direct contamination of the crop and soil as well as from contamination of surface water sources and other inputs. The following should be considered:

- Domestic and wild animals should be excluded from production and handling areas, to the extent possible, using appropriate control methods. Methods selected should comply with local, regional, and national environmental and animal protection regulations.
- If animals are used in the harvest of source plants for spices and dried aromatic herbs, care should be taken to ensure that the animals do not become a source of contamination, e.g. by animal faeces.
- Production and handling areas for source plants for spices and dried aromatic herbs should be properly maintained to reduce the likelihood of pest attraction. Activities to consider include efforts to minimize standing water in fields, to restrict access by animals to water sources, and to keep production sites and handling areas free of waste and clutter.

- Source plant production sites and handling areas for spices and dried aromatic herbs should be evaluated for evidence of the presence of wildlife or domestic animal activity (e.g. presence of animal faeces, large areas of animal tracks, or burrowing).

3.2. Hygienic production of food sources

19. Source plants for spices and dried aromatic herbs should be grown, harvested and cleaned of extraneous matter in accordance with Good Agricultural Practices (e.g. *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003)).

20. Arrangements for the disposal of domestic and industrial wastes in areas from which raw materials are derived should be acceptable to the competent authorities.

3.2.1 Agricultural input requirements

21. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003).

3.2.1.1 Water for primary production

22. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003). In addition, the following should be considered.

23. Source plants for spices and dried aromatic herbs should not be grown or produced in areas where the water used for irrigation might contaminate plants. Growers should identify the sources of water used on the farm (e.g. municipal water, well water (deep vs. shallow), surface water (e.g. rivers, reservoirs, ponds, lakes, open canals) re-used irrigation water, reclaimed wastewater, discharge water from aquaculture. It is recommended that growers assess and, where practicable, manage the risk posed by these waters as follows:

- Assess the potential for microbial contamination (e.g. from livestock, human habitation, sewage treatment, manure and composting operations) and the water's suitability for its intended use. Reassess the potential for microbial contamination if events, environmental conditions (e.g. temperature fluctuations, heavy rainfall, etc.) or other conditions indicate that water quality may have changed.
- Assess the potential for chemical contamination (e.g. from mine drainage, agricultural run-off, industrial waste) and the water's suitability for its intended use. Reassess the potential for chemical contamination if events or environmental or other conditions indicate that water quality may have changed.
- Identify and implement corrective actions to prevent or minimize contamination. Possible corrective actions may include fencing to prevent large animal access, properly maintaining wells, filtering water, not stirring the sediment when drawing water, building settling or holding ponds, and water treatment facilities. Settling or holding ponds that are used for subsequent irrigation may be microbiologically safe, but may attract animals or in other ways increase the microbial risks associated with water for irrigating plants. If water treatment is needed, consult with water safety experts.
- Determine if microbial and chemical analysis should be done to evaluate the suitability of water for each intended use. Analytical testing may be necessary after a change in irrigation water source, flooding or a heavy rainfall when water is at a higher risk of contamination.

3.2.1.2 Manure, biosolids and other natural fertilizers

24. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003).

3.2.1.3 Soil

25. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003).

3.2.1.4 Agricultural chemicals

26. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003). Growers should only use agriculture chemicals according to the procedures authorised by the competent authorities. In addition: Soil fungicides may be used on seedbeds or fields if necessary to reduce the amount of spores of mycotoxin-producing moulds.

- If appropriate, for preventive purposes, fungicides may be used on source plants, e.g. fruits, to avoid the introduction of mycotoxin-producing moulds.

3.2.3 Personnel health, hygiene and sanitary facilities

27. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003). In addition, the following should be considered:

- Where appropriate, each business engaged in primary production operations should have written procedures that relate to health, hygiene and sanitary facilities. The written procedures should address worker training,

facilities and supplies to enable agricultural workers to practice proper hygiene, and company policies relating to expectations for worker hygiene as well as illness reporting.

- All agricultural workers should properly wash their hands using soap and clean running water, followed by thorough drying, before handling source plants or dried spices and dried aromatic herbs, particularly during harvesting and post-harvest handling. If running clean water is not available, an acceptable alternative hand washing method should be agreed to by the relevant competent authority. Agricultural workers should be trained in proper techniques for hand washing and drying.
- Non-essential persons, casual visitors and, to the extent possible, children, should be deterred from entering the harvest area as they may present an increased risk of contamination. When such persons are present, care should be taken to ensure they do not become a source of contamination.

3.2.3.1 Personnel hygiene and sanitary facilities

28. Growers should consider providing, where practicable, areas away from the growing/harvest area for agricultural workers to take breaks and eat. For worker convenience, these areas should provide access to toilet and hand-washing and drying facilities so agricultural workers can practice proper hygiene.

29. As far as possible, sanitary facilities should be readily accessible to the work area.

- Sanitary facilities should be located in a manner to encourage their use and reduce the likelihood that agricultural workers will relieve themselves in the growing/harvest area.
- Portable facilities (if used) should not be located or cleaned in cultivation areas or near irrigation water sources or conveyance systems. Growers should identify the areas where it is safe to put portable facilities and to prevent traffic in case of a spill.
- Facilities should include clean running water, soap, toilet paper or equivalent, and single use paper towels or equivalent. Multiple use cloth drying towels should not be used. Hand sanitizers should not replace hand washing and should be used only after hands have been washed.

3.2.3.2 Health status

30. The following should be considered:

- Growers should be encouraged to observe symptoms of diarrheal or food-transmissible, communicable diseases and reassign agricultural workers to duties that do not involve direct handling of food as appropriate.
- Agricultural workers should be encouraged and, where feasible, be motivated with appropriate incentives to report symptoms of diarrheal or food-transmissible, communicable diseases.
- Medical examination of agricultural workers should be carried out if clinically or epidemiologically indicated.

3.2.3.3 Personal cleanliness

31. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003).

32. When personnel with cuts and wounds are permitted to continue working the injury should be covered by water-proof dressings firmly secured. In addition, there should be a secondary barrier between the cut or wound and the source plants handled, such as gloves or protective clothing, to cover the water-proof dressing.

3.3 Handling, Storage and Transport

33. Each source plant should be harvested using a method suitable for the plant part to be harvested in order to minimize damage and the introduction of contaminants. Plant matter that is damaged or other plant waste material should be disposed of properly and removed from the growing/harvest area in order to minimize the potential for it to serve as a source of mycotoxin-producing moulds. If possible, only the amount that can be processed in a timely manner should be picked in order to minimize growth of mycotoxin-producing moulds prior to processing. When the amount harvested exceeds processing capabilities, the excess should be stored under appropriate conditions.

3.3.1 Prevention of cross-contamination

34. Specific control methods should be implemented to minimize the risk of cross-contamination from microorganisms associated with harvesting methods. The following should be considered:

- Where appropriate, the soil under the plant should be covered with a clean sheet of plastic or clean plant material such as straw during picking/harvest to avoid contamination by dirt or plant matter that has fallen prior to harvesting. Plastic that will be reused should be easy to clean and disinfected. Plant material should be used only once.

- Source plant material that has fallen to the ground should be disposed of properly if it cannot be made safe by further processing.

3.3.2 Storage and transport from the growing/harvest area to the packing establishment

35. The containers and conveyances for transporting the source plant material or spices and dried aromatic herbs from the place of production to storage for processing should be cleaned and disinfested, as appropriate, before loading. Products should be protected, where practicable, against outdoor conditions when transported.

36. Prevent field debris from entering packing and storage facilities by cleaning the outside of harvest bins and requiring workers to wear clean clothes in those areas.

37. Spices and dried aromatic herbs should be kept in areas where contact with water or moisture is minimized.

38. Spices and dried aromatic herbs should be stored on raised platforms or hung under a non-leaking roof in a cool dry place. The storage location should prevent access, to the extent practicable, by rodents or other animals and birds and should be isolated from areas of excessive human or equipment traffic.

3.3.3 Drying

3.3.3.1 Natural Drying

39. Refer to the *Code of Practice for the Reduction of Contamination of Food with Polycyclic Aromatic Hydrocarbons (PAH) from Smoking and Direct Drying Processes* (CAC/RCP 68-2009) with regard to the location of the drying area.

40. Plants or parts of plants used for the preparation of spices and dried aromatic herbs may be dried naturally, e.g. air dried, provided adequate measures are taken to prevent contamination of the raw material during the process. The drying time depends on the environmental conditions surrounding the product, i.e. temperature, relative humidity, and air velocity.

41. If dried naturally, plants or parts of plants should be dried on clean, elevated racks, clean concrete floors, or clean mats or tarps or by hanging under a non-leaking roof and not on the bare ground or in direct contact with the soil. Pathways should be made in the drying area to prevent anyone from walking on the crop. The drying plant material should be raked/turned frequently to limit moulds growth.

42. Concrete floors or slabs poured specifically for drying source plants should be subject to an appropriate cleaning program and, where appropriate, disinfested. New concrete slabs should be used for drying only when it is absolutely certain that the new concrete is well-cured and free of excess water. A suitable plastic cover spread over the entire new concrete slabs can be used as a moisture barrier; however, the sheet should be completely flat to prevent the pooling of water. Suitable precautions should be taken, where practicable, to protect the spices and dried aromatic herbs from contamination and damage by domestic animals, rodents, birds, mites, insects or other objectionable substances during drying, handling and storage. If drying outdoors, drying platforms should be placed under a roof/tarp free of tears, holes or frayed material that will prevent rewetting by rainfall and contamination from birds overhead.

43. Drying time should be reduced as much as possible by using optimal drying conditions (e.g. temperature, humidity and ventilation) to avoid fungal growth and toxin production. The thickness layer of the drying source plant material should be considered in order to consistently achieve a safe moisture level.

3.3.3.2 Mechanical Drying (see Section 5.2.2.1).

3.3.4 Packing in the growing/harvest area

44. Packing activities can occur in the growing/harvest area. Such packing operations should include the same sanitary practices, where practical, as packing spices and dried aromatic herbs in establishments or modified as needed to minimize risks. To prevent germination and growth of spores, the products must be dried to a safe moisture level prior to packing.

45. When packing spices and dried aromatic herbs in the growing/harvest area for transport, storage, or for further sale, new bags should be used to prevent the potential for microbial, physical and chemical contamination. When bags are marked, food-grade ink should be used to minimize the potential for contamination with ink. When bags have an open structure, such as jute bags, the bag should not be marked when filled with spices and dried aromatic herbs to prevent liquid ink from contaminating the contents and increasing the moisture in the spices and dried aromatic herbs. It is recommended that paper tags be used instead of liquid ink for marking.

46. Removal of discarded plant material should be done on a regular basis in order to avoid accumulation that would promote the presence of pests.

3.4 Cleaning, Maintenance and Personnel Hygiene at Primary Production

47. Refer to the Code of Hygienic Practice for Fresh Fruits and Vegetables (CAC/RCP 53-2003).

3.4.1 Cleaning programs

48. The following should be considered:

- Harvesting equipment, including knives, pruners, machetes, that come into direct contact with source plants for spices and dried aromatic herbs should be cleaned at least daily or as the situation warrants and, when necessary, disinfected.
- Clean water should be used to clean all equipment directly contacting spices and dried aromatic herbs, including farm machinery, harvesting and transportation equipment, containers and knives.
- Equipment should be allowed to dry before use.

3.4.2 Cleaning procedures and methods

49. Cleaning and disinfection programs should not be carried out in a location where the rinse water might contaminate source plant material used for spices and dried aromatic herbs.

SECTION IV - ESTABLISHMENT: DESIGN AND FACILITIES

4.2 Premises and rooms

50. Where practicable, buildings and facilities should be designed to provide separation, by partition, location or other effective means, between operations that could result in cross contamination. They should be designed to facilitate hygienic operations according to the one-way flow direction, without backtracking, from the arrival of the raw materials at the premises to the finished product, and should provide for appropriate temperature conditions for the process and the product.

51. The application of appropriate hygienic design standards to building design and layout is essential to ensure that contaminants are not introduced into the product. Hygienic design should ensure that if a pathogen such as *Salmonella* spp. is introduced it does not become established in specific areas that can serve as a source of contamination of the product. Premises and rooms used for spices and dried aromatic herbs should be physically separated from wet processing areas and designed such that they can be cleaned routinely with little or no water, when wet cleaning is required, premises and rooms should be thoroughly dried before introducing spices and dried aromatic herbs again.

52. Since limiting water is the primary means to control microbial growth from pathogens such as *Salmonella* spp. or mycotoxin-producing moulds in establishments processing and packing spices and dried aromatic herbs, premises and rooms should be designed to exclude moisture from the environment. In general, areas in which spices and dried aromatic herbs are handled should not have drains, however, if drains are present, the surrounding floor should be properly sloped for effective drainage and kept dry under normal conditions.

53. Procedures should be established to inspect the integrity of the establishment (e.g. for roof leaks); such problems should be corrected as soon as they are detected.

54. Proper ventilation should be in place to correctly manage temperature, humidity and dust in the establishment. Calibrated electronic sensors may be used to monitor temperature and humidity. In addition, airflow in the establishment should provide for higher air pressures in the packaging areas and lower air pressures in rooms where incoming materials are handled. Exhaust vents should be hygienically designed to prevent the formation and accumulation of condensation around the vent exit and to prevent water from re-entering the establishment. Exhaust ducts should be cleaned on a regular basis and should be designed to prevent reverse air flow.

55. Premises and rooms should be designed with a means of dust control, since spices and dried aromatic herbs are likely to generate particulate matter that can be carried to other parts of the room or premises by air currents.

56. Elevated infrastructure should be designed to minimize the accumulation of dust and dry material, especially when pipes, overhead structures and platforms are directly above exposed spices and dried aromatic herbs.

57. Construction and major maintenance activities can dislodge microorganisms from harbourage sites where they have become established and lead to widespread contamination of the establishment. Because some microorganisms such as *Salmonella* spp. can survive in dry environments for long periods of time, construction activities may release these microorganisms from hidden harbourage sites. Preventative measures such as temporary isolation of the construction or maintenance sites, rerouting of employee and equipment traffic, proper handling of construction material entry and waste material egress, maintaining negative pressure in the work site, and other appropriate measures should be implemented during construction and maintenance.

4.3 Equipment

58. Equipment should be designed to facilitate cleaning and disinfection with little or no water and, when wet cleaning is required, to allow thorough drying before reusing the equipment for spices and dried aromatic herbs. Alternatively the design should allow disassembly such that parts can be taken to a room designed for wet cleaning and disinfection, when applicable. The equipment design should be as simple as possible, with a minimal number of parts and with all parts and assemblies easily accessible and/or removable for inspection and cleaning. Equipment should not have pits, cracks, corrosion, crevices, recesses, open seams, gaps, lap seams, protruding ledges, inside threads, bolt rivets, or dead ends.

59. Hollow areas of equipment as well as cracks and crevices should be eliminated whenever possible or permanently sealed. Items such as bolts, studs, mounting plates and brackets should be continuously welded to the surface and not attached via drilled and tapped holes. Welds should be ground and polished smooth.

60. Push buttons, valve handles, switches and touch screens should be designed to ensure product and other residues (including liquid) do not penetrate or accumulate in or on the enclosure or interface.

61. Equipment should be installed so as to allow access for cleaning and to minimize transfer of dust particles to other pieces of equipment or to the environment.

62. The risk of contamination from equipment should be assessed and controlled. Wherever possible, forklifts, utensils, and maintenance tools for the finished product and packaging areas should be different from those used in the "raw" material area (e.g. prior to the microbial reduction treatment).

4.4 Facilities

4.4.8 Storage

63. Spices and dried aromatic herbs are susceptible to mould contamination and/or growth if storage conditions are not appropriate. Spices and dried aromatic herbs should be stored in an environment with humidity that does not result in product moisture that can support the growth of moulds.

SECTION V - CONTROL OF OPERATION

5.1 Control of food hazards

64. Measures should be taken at each step in the food chain to minimize the potential for contamination of spices and dried aromatic herbs by microbial pathogens (including mycotoxin-producing moulds), chemical contaminants, excreta, rodent hair, insect fragments and other foreign materials.

65. Depending on the activities conducted at the establishment, it may be useful to separate the establishment into areas or zones, such as the raw material (pre-processing) area and the post-processing area, with stricter controls in areas post-processing where a microbial reduction treatment has been delivered and in the areas where product is being packaged.

66. Traffic patterns should be established with respect to movement of personnel and materials (e.g. ingredients used in dry-mixing, packaging materials, pieces of equipment, carts and cleaning tools) according to the one-way flow direction, without backtracking, with partitioning/separation of operations in order to minimize tracking of materials from other areas, e.g. the raw material area to the finished product area, in order to prevent cross-contamination.

67. Should the spices and dried aromatic herbs become contaminated with a pathogen such as *Salmonella* spp., the pathogen can become established in a specific area. If the harbourage site becomes wet, the pathogen can grow to large numbers and the harbourage site can serve as a source of contamination to other places in the establishment, including food contact surfaces and products exposed to the environment. Therefore, potential harbourage sites should be identified and kept as dry as possible.

68. In the case of an unusual event, such as a roof leak or a faulty sprinkler that introduces water into the dry production or packaging environment, production should be stopped. The leak should be fixed, and the area cleaned, disinfected and dried before production resumes. Products damaged from the unusual event should be evaluated based on risk and, where appropriate, properly treated or kept from entering the food chain.

5.2 Key aspects of hygiene control systems

5.2.2 Specific process steps

5.2.2.1 Mechanical Drying

69. Plants or parts of plants used for the preparation of spices and dried aromatic herbs may be dried mechanically (e.g. forced air drying), provided adequate measures are taken to prevent contamination of the raw material during the process. To prevent the growth of microorganisms, especially mycotoxin-producing moulds, a safe moisture level should be achieved as rapidly as possible.

70. Mechanical drying methods should be used instead of natural (open) air drying, where possible, to limit exposure of spices and dried aromatic herbs to environmental contaminants and to prevent growth of moulds. If hot air drying is used, the air should be free of contaminants and precautions should be made to prevent combustion gases from contacting the plant material or stored plant material in the area.

71. Drying time should be reduced as much as possible by using optimal drying conditions to avoid fungal growth and toxin production. The thickness layer of the drying source plant should be considered in order to consistently achieve a safe moisture level.

5.2.2.2. *Cleaning of spices and dried aromatic herbs*

72. Spices and dried aromatic herbs should be cleaned properly (e.g. culled and sorted) to remove physical hazards (such as the presence of animal and plant debris, metal and other foreign material) through manual sorting or the use of detectors, such as metal detectors. Raw materials should be trimmed to remove any damaged, rotten or mouldy material.

73. Debris from culling and sorting should be periodically collected and stored away from the drying, processing and packaging areas to avoid cross-contamination and attracting pests.

5.2.2.3 *Microbial Reduction Treatments*

74. In order to control microbiological contamination, appropriate methods of treatment may be used in accordance with the regulations set by the competent authority. When necessary to reduce risk, spices and dried aromatic herbs should be treated with a validated microbial reduction treatment prior to reaching the consumer in order to inactivate pathogens such as *Salmonella*. For additional information on validation, refer to the *Guidelines for the Validation of Food Safety Control Measures* (CAC/GL 69-2008). Commonly used methods involve the application of steam, fumigation or radiation. Where spices and dried aromatic herbs are irradiated, refer to the *Code of Practice for Radiation Processing of Food* (CAC/RCP 19-1979) and the *General Standard for Irradiated Foods* (CODEX STAN 106-1983).

75. Factors that should be controlled when using steam include exposure time and temperature. The process should ensure that all of the product achieves the desired temperature for the full length of time required. A drying step may be necessary to remove added moisture.

76. Factors that should be controlled when using irradiation include radiation dose and the size and shape of the package, as well as the penetrability of the packaging material to the type of radiation used. The process should ensure that all of the product is exposed to the minimum dose of radiation needed to provide the intended effect.

77. Factors that should be controlled when using fumigation treatments such as ethylene oxide or propylene oxide include chemical concentration, exposure time, vacuum and/or pressure, density of the product, and gas permeability of the packaging material. The process should ensure that all product is directly exposed to the gas for the full length of time required.

78. For pathogen inactivation treatments the adequacy of the selected control measure (thermal or non-thermal) and associated critical limits for processing should be determined, considering the increased heat resistance reported for *Salmonella* at low water activities and the increased resistance of spores to most microbial reduction treatments. In some cases, challenge studies may be needed to support validation. Once the lethality of the process is validated by scientific data, the establishment should periodically verify that the process continues to meet the critical limits during operation and the process criteria intended to achieve microbiocidal effects in the establishment.

5.2.3 *Microbiological and other specifications*

79. Refer to the *General Principles of Food Hygiene* and the *Principles and Guidelines for the Establishment and Application of Microbiological Criteria Related to Foods* (CAC/GL 21-1997).

80. Where appropriate, specifications for pathogenic and toxigenic microorganisms, chemical residues, foreign material, and decomposition should be established that take into account subsequent processing steps, the end use of the spice or dried aromatic herb and the conditions under which the product was produced.

81. When tested by appropriate methods of sampling and examination, the products should:

- (a) Be free from pathogenic and toxigenic microorganisms in levels that may present a risk to health; and should comply with the provisions for food additives;
- (b) Not contain any substances originating from microorganisms, particularly mycotoxins, in amounts that exceed the tolerances or criteria established by the Codex Alimentarius Commission or, where these do not exist, by the competent authority;
- (c) Not contain levels of insect, bird or rodent contamination that indicate that spices and dried aromatic herbs have been prepared, packed or held under unsanitary conditions;

(d) Not contain chemical residues resulting from the treatment of spices and dried aromatic herbs in excess of levels established by the Codex Alimentarius Commission or, where these do not exist, by the competent authority;

(e) Comply with the provisions for contaminants, and with maximum levels for pesticide residues established by the Codex Alimentarius Commission or, where these do not exist, by the competent authority.

82. In view of the limitations of end-product testing, food safety should be assured through the design of an appropriate food safety control system and by verification of the implementation of the system and the effectiveness of the control measures e.g. through appropriate Quality Assurance or Quality Control auditing methods.

83. Microbiological testing can be a useful tool to evaluate and verify the effectiveness of food safety and sanitation practices, provide information about an environment, a process, and even a specific product lot, when sampling plans and methodology are properly designed and performed. The intended use of information obtained (e.g. evaluating the effectiveness of a sanitation practice, evaluating the risk posed by a particular hazard, etc.) can aid in determining what microorganisms are most appropriate to test for. Test methods validated for the intended use should be selected. Consideration should be given to ensure proper design of a microbiological testing program. Trend analysis of testing data should be undertaken to evaluate the effectiveness of food safety control systems.

84. Verification activities may include, as necessary, appropriate environmental and/or product testing. When monitoring control measures and verification results demonstrate deviations, appropriate corrective action should be taken and the finished product should not be released until it is shown that it complies with appropriate specifications.

5.2.4 Microbiological cross-contamination

85. Effective measures should be taken to prevent cross-contamination of uncontaminated spices and dried aromatic herbs by direct or indirect contact with potentially contaminated material at all stages of the processing. Raw products that may present a potential hazard should be processed in separate rooms, or in areas physically separate from those where end-products are being prepared. Spices and dried aromatic herbs that have undergone a microbial reduction treatment should be processed and stored separately from untreated spices and dried aromatic herbs. Equipment should not be used for both treated and untreated products without adequate cleaning and disinfection before use with treated products.

86. Persons handling raw materials or semi-processed products capable of contaminating the end-product should not come into contact with any end-product unless and until they discard all protective clothing worn during the handling of the material at earlier stages of the processing and have changed into clean protective clothing. Hands should be washed and disinfected thoroughly before handling products at different stages of processing.

5.2.5 Physical and chemical contamination

87. Appropriate machines should be used to remove physical hazards such as pebbles or heavier stones. To separate foreign matter from the product, air tables or gravity separators can be used for particles of the same size and different density. Sieves of different diameters may be used to obtain the size required for each product and to remove foreign matter.

88. Regardless of the type of separator used, the following parameters should be considered: size of particles, density, weight and size, air speed, inclination of the sieve plate, vibration, etc. for the highest effectiveness of the procedure.

89. Magnets/metal detectors should be used to detect and separate ferrous from non-ferrous/metallic matter. For good extraction, magnets should be as close as possible to the metals to be extracted. Magnets work more efficiently when product flows freely. If needed, more than one magnet should be placed in the line. Magnets should be cleaned frequently. Equipment should be designed in such a way as to prevent metals extracted by magnets from being swept by the flow of product. Spices and dried aromatic herbs should be arranged in a fine layer to facilitate this operation.

90. In all cases, particles identified by the metal detector should be removed and records kept of how much and what type of foreign matter was collected and when it was cleaned. This data should be used in determining how the metals or foreign matter got there in order to implement appropriate corrective measures.

5.3 Incoming material requirements

91. Spices and dried aromatic herbs or their source plants should not be accepted by the establishment if they are known to contain contaminants which will not be reduced to acceptable levels by normal processing procedures, sorting or preparation. Precautions should be taken to minimize the potential for contamination of the establishment and other products from incoming materials that may be contaminated. Plants, parts of plants, spices and dried aromatic herbs suspected of being contaminated with animal or human faecal material should be

rejected for human consumption. Special precautions should be taken to reject spices and dried aromatic herbs showing signs of pest damage or mould growth because of the potential for them to contain mycotoxins such as aflatoxins.

92. Raw materials should be inspected and sorted prior to processing (foreign matter, odour and appearance, visible mould contamination). Laboratory tests, e.g. for moulds or pathogens such as *Salmonella*, should be conducted when necessary.

93. Spices and dried aromatic herbs and blends of these are often manufactured without a step that would inactivate pathogens. Spices and dried aromatic herbs should be obtained from approved suppliers. An approved supplier is one that can provide a high degree of assurance that appropriate controls in accordance with this Code have been implemented to minimize the possibility that chemical, physical and microbiological contamination occurs in the ingredient. Because of the diversity of production practices for spices and dried aromatic herbs, it is important to understand the controls in place for production of the incoming material. When the control measures used to produce the spices and dried aromatic herbs are not known, verification activities such as inspection and testing should be increased.

94. Consideration should be given to a program for testing spices and dried aromatic herbs to be used without a lethality step for relevant pathogens, e.g. *Salmonella*. Spices and dried aromatic herbs in which *Salmonella* is detected should not be used unless they are subjected to an effective microbial reduction treatment.

5.4 Packaging

95. Non-porous bags/containers should be used to protect the spices and dried aromatic herbs from contamination and the introduction of moisture, insects and rodents. In particular, the reabsorption of ambient moisture in humid tropical climates should be prevented. Contamination should be prevented by the use of liners where appropriate. It is recommended that new bags or containers be used for food contact packaging. If reusable containers are used, they should be properly cleaned and disinfected before use. All bags/containers should be in good condition and particular attention paid to the potential for loose bag fibres that can become potential contaminants. Secondary containment bags/containers providing additional protection can be reused but should not have been previously used to hold non-food materials such as chemicals or animal feed.

96. Spices and dried aromatic herbs, e.g. dried chilli peppers, should not be sprayed with water to prevent breakage during packing. This may result in growth of moulds and microbial pathogens, if present.

97. Finished products may be packed in gas tight containers preferably under inert gases like nitrogen or under vacuum in order to retard possible mould growth.

5.5 Water

98. The presence of water in the food processing environment, even in very small amounts for short, sporadic time periods, may allow microorganisms, including mycotoxin-producing moulds and pathogens such as *Salmonella*, to grow in the environment. At times, moisture is obvious in the form of water droplets or puddles; or it may be from sporadic sources such as roof leaks. Other sources of moisture may be less visually apparent, including high relative humidity or moisture accumulating inside of equipment. Care should be taken to identify and eliminate such sources of water in the environment to prevent the development of harbourage sites that can become a source of product contamination.

5.7 Documentation and records

99. Refer to the *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003).

100. Where practicable, a written food safety control plan that includes a description of each of the hazards identified in the hazard analysis process, as well as the control measures that will be implemented to address each hazard, should be prepared by food business operators. The description should include, but is not limited to, the following: an evaluation of the production site, water and distribution system, manure use and composting procedures, personnel illness, reporting policy, sanitation procedures and training programs.

101. The following are examples of the types of records that should be retained:

- Microbiological testing results and trends analysis
- Water monitoring and test results
- Manure composting records
- Records of plant protection products used (e.g. pesticides, fungicides, herbicides)
- Employee training records
- Pest control records
- Cleaning and sanitation reports

- Equipment monitoring and maintenance records (e.g. calibration)
- Inspection/audit records

5.8 Traceability/Product tracing and Recall procedures

102. Records should identify the source (or lot number) of incoming raw materials and link the source or lot to the lots of outgoing products to facilitate traceability/product tracing. Reference should also be made to *Principles for Traceability/Product Tracing as a Tool within a Food Inspection and Certification System* (CAC/GL 60-2006).

SECTION VI - ESTABLISHMENT: MAINTENANCE AND SANITATION

6.1 Maintenance and cleaning

103. Dust accumulation from product in establishments (i.e. on walls, ceilings, conveyor belts, lids and walls of batch tanks or mixing tanks, and the bottom of a bucket elevator) should be removed in a timely fashion through routine housekeeping. This is particularly important for products that are hygroscopic or in environments of high humidity leading to moisture absorption and localized condensation.

6.2 Cleaning programmes

104. A cleaning and disinfection schedule should be established to ensure that all areas of the establishment are appropriately cleaned and that special attention is given to critical areas including equipment and materials. The air handling system should be included in the cleaning and disinfection schedule. The cleaning and disinfection schedule should describe whether to use wet or dry cleaning. The presence of water in the dry processing environment can result from improper use of water during cleaning.

105. Dry cleaning is the preferred means of cleaning establishments handling spices and dried aromatic herbs, since the use of water can enhance the probability of contamination from pathogens such as *Salmonella*. Dry cleaning should collect, remove and dispose of residues without redistributing them or cross contaminating the environment. Dry cleaning involves the use of tools such as vacuum cleaners, brooms, and brushes. Brooms, brushes and vacuum cleaners should be dedicated to specific areas to minimize cross-contamination. By dedicating individual vacuum cleaners to specific areas, vacuumed material can be tested as part of an environmental monitoring program.

106. Compressed air should generally not be used for dry cleaning except in special situations (e.g. to dislodge dust from inaccessible points). Moreover, if and when compressed air is used, it should be dried and filtered to exclude microorganisms and moisture prior to use.

107. Dry cleaning is especially important in older establishments in which, in spite of regular maintenance, there may be a potential for the presence of cracks or other harbourage sites that may be difficult to eliminate. Even if residues of spices and dried aromatic herbs enter such a site, potential problems can be minimized if the residues and the sites are dry and kept dry. Once water enters the harbourage site, microbial growth can occur and the potential risk of contamination to the environment and eventually to the product is increased.

108. Wet cleaning may be appropriate in certain circumstances, e.g. when *Salmonella* has been detected in the environment. When water usage is necessary, minimal amounts should be used, and the use of high pressure hoses should be avoided. When wet cleaning is used, it should be followed by disinfection to inactivate microorganisms. Disinfectants that will rapidly evaporate after contact, such as alcohol-based disinfectants, provide a means to spot-disinfect equipment with a very minimal introduction of water. Wet cleaning and disinfection should be followed by thorough drying in order to keep the environment of the establishment as dry as possible.

6.3 Pest control systems

109. Drains should be trapped or otherwise equipped with appropriate means to prevent entry of pests from drainage systems.

6.4 Waste management

110. Suitable provision must be made for the storage and removal of waste. Storage areas for waste should be kept clean. Care should be taken to prevent access to waste by pests.

6.5 Monitoring effectiveness

111. Verification of sanitation should include an environmental monitoring program that has been designed to identify pathogens such as *Salmonella* in the processing areas. Environmental monitoring should be conducted under normal operating conditions and will usually involve non-product contact surfaces. Product contact surface testing may be done, particularly as part of corrective actions for an environmental positive. Testing of the spices and dried aromatic herbs may also be conducted based on the results of environmental monitoring. Corrective actions should be taken when the microbiological criterion for the test organism is exceeded in an environmental monitoring or finished product sample.

SECTION VII - ESTABLISHMENT: PERSONAL HYGIENE

112. Refer to the *General Principles of Food Hygiene* (CAC/RCP 1-1969).

SECTION VIII - TRANSPORTATION

113. Refer to the *Code of Practice for the Packaging and Transport of Fresh Fruit and Vegetables* (CAC/RCP 44-1995). In addition, bulk transport of spices and dried aromatic herbs, such as by ship or rail, should be well ventilated with dry air to prevent moisture condensation, e.g. resulting from respiration and when the vehicle moves from a warmer to a cooler region or from day to night. Prior to bulk transport, the products must be dried to a safe moisture level to prevent germination and growth of mould spores.

8.1 General Requirements for Transportation

113. Spices and dried aromatic herbs should be stored and transported under conditions that maintain the integrity of the container and the product within it. Vehicles should be clean, dry, and free from infestation. Spices and dried aromatic herbs should be loaded, transported, and unloaded in a manner that protects them from any damage or water. Care should be taken to prevent condensation when unloading spices and dried aromatic herbs from a refrigerated vehicle or while taking out of a cold storage. In warm, humid weather, the products should be allowed to reach ambient temperature before exposure to external conditions. Spices and dried aromatic herbs that have been spilled are vulnerable to contamination and should not be used as food.

SECTION IX - PRODUCT INFORMATION AND CONSUMER AWARENESS

114. Refer to the *General Principles of Food Hygiene* (CAC/RCP 1-1969).

SECTION X - TRAINING**10.2 Training Programs**

115. A training program should be established to educate employees on the potential sources of contamination of spices and dried aromatic herbs during production, harvesting, processing, transportation and storage. Training should address proper hygienic practices to follow in order to minimize the entry or spread of pathogens such as *Salmonella* spp. Such training should include personnel who enter areas on a temporary basis (e.g. maintenance workers, contractors).

Appendix VI**PROJECT DOCUMENT****Development of Guidelines for the Control of Nontyphoidal *Salmonella* spp. in Beef and Pork Meat****1. The purposes and scope of the Standard**

The purpose and scope of the work is to draft guidelines for the control of nontyphoidal *Salmonella* spp.¹ in beef and pork meat.

2. Its relevance and timeliness

Salmonellosis is one of the most frequently reported foodborne diseases worldwide and also one of the most complex in its epidemiology and control. The reported incidence of salmonellosis per 100,000 people generally varies between about 2 and 90 in different countries².

In the United States (U.S.) the Centers for Disease Control and Prevention (CDC) estimate domestically acquired foodborne nontyphoidal salmonellosis burden to be 1,027,561 (90% Credible Interval: 644,786 – 1,679,667) estimated annual illnesses, 19,336 (90% Credible Interval: 8,545 – 37,490) estimated annual hospitalizations and 378 (90% Credible Interval: 0 – 1,011) estimated annual deaths³. *Salmonella* is the leading pathogen causing domestically acquired foodborne illnesses resulting in death. For 2012, approximately 16.4 cases of salmonellosis per 100,000 persons were identified through the U.S. FoodNet surveillance system⁴. *Salmonella* had the largest number of hospitalizations (2,284) and deaths (33) among other reportable foodborne diseases⁴. In 2012, among laboratory-confirmed bacterial and parasitic infections, salmonellosis incidence was highest in children aged <5 years (63.5 infections per 100,000) followed by children aged 5-9 at 19.3 infections per 100,000⁴. The overall incidence of *Salmonella* infection in 2012 was not significantly different than during 1996–1998, the start of the FoodNet surveillance system, nor the more recent time period of 2006–2008⁴. In addition, the CDC recently recommended that “*Salmonella* infection should be targeted because it has not declined significantly in more than a decade, and other data indicate that it is one of the most common foodborne infections, resulting in an estimated \$365 million in direct medical costs annually.”⁵

In the European Union (E.U.) a total of 99,020 confirmed cases of human salmonellosis were reported by 27 E.U. member states in 2010². The rate for confirmed cases was 21.5 cases per 100,000 people. This was an 8.8 % (9,598 cases) reduction in 2010, which is about half of the reported reduction rate in 2009 (17.4 % and 22,854 cases). In 2010, 62 deaths were reported - the case fatality rate of human salmonellosis was 0.13 %. The reported incidence of salmonellosis among the 27 member states varies widely. Per 100,000 people the case rate varies between 1.9 and 91.1 in different countries⁶.

Review of the literature reveals that *Salmonella* can be found in beef and pork products at slaughter, processing, and retail. In the U.S., the most recent data in 2010 suggest that *Salmonella* are present on about 0.5% of cow/bull and 0.1% of steer/heifer swab sample tests on carcasses at the processing establishment. For raw ground beef about 2.4% of samples contained *Salmonella* in 2011.⁷ For pork carcasses, a 2011 baseline⁸ estimated the national prevalence to be about 1.7% for *Salmonella* using carcass swabs. At retail, the 2011 percent positive rate for this pathogen in ground beef was 0.7% and on pork chops, 2.1%⁹. In the E.U. reporting member states, 0.9% of tested samples at various points during processing were found positive for *Salmonella* in fresh pork. The proportion of *Salmonella*-positive samples taken at different establishments ranged from 0.3% to 8.9%. The overall percentage of positive samples at retail was 1.0%. In the case of fresh beef, 0.2 % of samples were positive at various points during processing⁶.

Salmonella spp. have been reported to be associated with foodborne disease outbreaks attributed to both beef and pork consumption. In the U.S., between the years 1998-2008, 877 outbreaks that had a simple or complex food vehicle were caused by *Salmonella enterica*. Of those, 128 were associated with beef, while 115 were associated with pork.¹⁰ Of all the illnesses caused by these outbreaks, 7.3% are attributed to beef and 6.2% from pork. The

¹ The genus *Salmonella* belongs to the family *Enterobacteriaceae*. The bacterium is a facultative anaerobic, gram-negative rod. The genus consists of two species, *Salmonella enterica* and *Salmonella bongori*. *Salmonella enterica* includes both typhoidal and nontyphoidal *Salmonella*. This document only addresses nontyphoidal *Salmonella* and all nontyphoidal *Salmonella* spp. are referred to as *Salmonella*. More than 2,400 *Salmonella* serotypes have been identified.

² <http://www.efsa.europa.eu/en/efsajournal/doc/2597.pdf>

³ <http://wwwnc.cdc.gov/eid/article/17/1/p1-1101-t2.htm>

⁴ <http://www.cdc.gov/mmwr/pdf/wk/mm6215.pdf>

⁵ http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6022a5.htm?s_cid=mm6022a5_w

⁶ <http://www.efsa.europa.eu/en/efsajournal/doc/2597.pdf>

⁷ FSIS Verification Data http://www.fsis.usda.gov/PDF/Progress_Report_Salmonella_Testing_1998-2011.pdf

⁸ http://www.fsis.usda.gov/PDF/Baseline_Data_Market_Hogs_2010-2011.pdf

⁹ NARMS Retail Data,

<http://www.fda.gov/downloads/AnimalVeterinary/SafetyHealth/AntimicrobialResistance/NationalAntimicrobialResistanceMonitoringSystem/UCM334834.pdf>

¹⁰ Painter et al., 2013; <http://wwwnc.cdc.gov/eid/article/19/3/pdfs/11-1866.pdf>

remaining 86.5% of *Salmonella* illnesses are caused by other foods. Beef represents approximately 75,000 (36,000-153,000) and pork represents approximately 64,000 (37,000-117,000) illnesses. In the E.U., of all the illnesses caused by these outbreaks, 4.7% are attributed to beef and 5.3% from pork⁶.

The World Organisation for Animal Health (OIE) also recognizes the importance of examining *Salmonella* in food-producing animals other than poultry. Since 2010, OIE's Working Group on Animal Production Food Safety discussed the need for and feasibility of developing OIE advice on the control of *Salmonella* spp. in food-producing animals other than poultry (i.e., pigs, cattle, small ruminants) with the purpose of reducing foodborne illness. They worked on a paper on the feasibility of applying measures at the production level (farm-level) to reduce the incidence of *Salmonella* spp. in intensive pigs (i.e., pigs raised in feed lots up to slaughter), to assess likely public health outcomes of applying such measures, and to provide more information on the prevalence of foodborne salmonellosis in humans from food-producing animals other than poultry. Though OIE felt this initiative important, at their November 2012 meeting¹¹, they felt unilateral advancement of this work in OIE alone is unlikely to significantly improve *Salmonella* risk management in animals other than poultry. Rather, they agreed that should Codex initiate new work on *Salmonella* spp. in food-producing animals other than poultry, then the Working Group would encourage OIE participation to ensure a whole food chain approach. This project document for new work by CCFH is consistent with the OIE's focus on *Salmonella* in animals other than poultry.

3. The main aspects to be covered

The Guidelines will provide an "enabling" framework which countries can utilize to establish control measures appropriate to their national situation and will follow the example of the overarching Codex *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005). It is not the intention of the Guidelines to set quantitative limits for *Salmonella* in beef and pork meat in international trade.

The projected format will follow the Codex *Guidelines for the Control of Campylobacter and Salmonella in Chicken Meat* (CAC/GL 78-2011) and include only provisions of particular importance for the safety of beef and pork meat. It would include (similar to the chicken meat guidelines), but not necessarily be limited to:

- Control measures for primary production (reference and work with OIE, e.g. their Working Group on Animal Production Food Safety)
- Control measures for processing
- Control measures for distribution channels
- Validation of control measures
- Verification of control measures
- Monitoring and review

4. Assessment against the Criteria for the establishment of work priorities

4.1 General criterion: Consumer protection from the point of view of health, food safety, ensuring fair practices in the food trade and taking into account the identified needs of developing countries.

The proposed work is directed primarily at the control of *Salmonella*, a microbial hazard that is a common public health problem world-wide. This document will provide guidance to all countries on the hygienic production of beef and pork meat.

4.2 Criteria applicable to general subjects

(a) Diversification of national legislation and apparent resultant or potential impediment to international trade

(b) Scope of work and establishment of priorities between the various sections of the work

(c) Work already undertaken by other international organizations in this field and/or suggested by the relevant international intergovernmental body(ies).

N/A

(d) Amenability of the subject of the proposal to standardization

No problem is foreseen.

(e) Consideration of the global magnitude of the problem or issues

Salmonellosis is of global concern. Codex guidelines now exist for control of *Salmonella* in chicken meat, but beef and pork meat are also recognized as contributing to global salmonellosis. Similar Codex guidance is therefore relevant for beef and pork meat.

¹¹ OIE Working Group on Animal Production Food Safety, Report of the Meeting of the OIE Animal Production Food Safety Working Group, Paris, 20–22 November 2012;
http://www.oie.int/fileadmin/Home/eng/Food_Safety/docs/pdf/A_APFSWG_Nov_2012.pdf

5. Relevance to the Codex strategic objectives

The proposed work directly relates to the following Codex Strategic Goals from the 2014-2019 Strategic Plan.

Goal 1: Establish international food standards that address current and emerging food issues.

This work addresses Objective 1.1: Establish new and review existing food standards, based on priorities of the CAC and Objective 1.2: Proactively identify emerging issues and member country needs and, where appropriate, develop relevant food standards.

This work is consistent with Objective 1.3: Strengthen coordination and cooperation with other international standards-setting organizations seeking to avoid duplication of efforts and optimize opportunities. The World Organisation for Animal Health (OIE) is reviewing the scientific literature on *Salmonella* spp. in food producing animals other than poultry (i.e. pigs, cattle, small ruminants) and on verotoxigenic *E. coli* (VTEC) in food producing animals. The objective of this review is to determine the usefulness and feasibility of future work of OIE in this area.

6. Information on the relation between the proposal and other existing Codex documents

The proposed Guidelines will follow the example of the overarching Codex *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005) and provide an “enabling” framework, which countries can utilize to establish control measures appropriate to their national situation.

The projected format will follow the Codex *Guidelines for the Control of Campylobacter and Salmonella in Chicken Meat* (CAC/GL 78-2011) and include only provisions of particular importance for the safety of beef and pork meat.

7. Identification of any requirement for and availability of expert scientific advice

We anticipate that there may be a need for scientific advice from FAO/WHO’s expert body JEMRA on the scientific and practical soundness of the proposed control measures and their validation, verification, and review activities.

8. Identification of any need for technical input to the standard from external bodies so that this can be planned for

Since the OIE’s Working Group on Animal Production Food Safety has been discussing the issue of *Salmonella* in food-producing animals other than poultry, particularly for pre-harvest (production level, farm level) controls, the body should be notified and cooperation encouraged.

9. The proposed time-line for completion of the new work, including the start date, the proposed date for adoption at Step 5, and the proposed date for adoption by the Commission

Start date – new work approved by the Commission in 2014

Adoption at Step 5 – 2017

Adoption at Step 8 - 2018

Appendix VII**PROJECT DOCUMENT****Development of Guidelines on the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites****1. Purpose and Scope of the Guideline**

The purpose is to provide guidance on the occurrence and control of parasites in food. The main document would include control measures applicable to all foodborne parasites such as good agricultural and hygienic practices. Information on the occurrence of major foodborne parasites (disease, distribution, foods associated with infection, transmission routes (life cycle)) and specific parasite/commodity control measures would be outlined in supporting annexes.

2. Relevance and Timeliness

Foodborne parasites are a major health burden worldwide (estimated to infect over 2 billion people), particularly in developing countries. Although the global impact of foodborne diseases on public health is largely unknown due to limited data. The WHO Foodborne Disease Epidemiology Reference Group (FERG) assessed the global burden of human foodborne trematodiasis in 2005 and estimated that 56.2 million people were infected by foodborne trematodes, of which 7.8 million suffered from severe sequelae and 7,158 died worldwide (FAO/WHO report, data for the year 2005).

In 2011, the Codex Committee for Food Hygiene acknowledged the public health impacts from foodborne parasites and requested FAO/WHO to provide advice and guidance on the parasite-commodity combinations of particular concern. The FAO/WHO *Report on Multicriteria-Based Ranking for Risk Management of Foodborne Parasites*¹ (FAO/WHO report) lists 24 parasites or parasite genera (or families) of public health concern. These include protozoa, cestodes, nematodes and trematodes. The major food vehicles associated with parasites are meat (e.g. pork, beef, lamb), fish and crustaceans, fresh produce and fruit juices.

3. Main aspects to be covered

The Guideline would follow the format of the *General Principles of Food Hygiene* (CAC/RCP 1-1969), and include only provisions of particular importance for the control of parasites. Contamination of food products by parasites may occur at several points along the food production process and the following measures are applicable to the management of all foodborne parasites:

- Minimising contamination at primary production
- Minimising contamination post-harvest
- Specific process steps to eliminate or reduce the parasite to acceptable levels
- Consumer awareness

Information on the occurrence of a particular parasite or parasite group and specific control strategies (particularly measures to minimise the number of transmission stages and/or kill the parasites or reduce their numbers) would be included in annexes.

4. Assessment against the Criteria for the establishment of work priorities**4.1 General criterion: Consumer protection from the point of view of health, food safety, ensuring fair practices in the food trade and taking into account the identified needs of developing countries.**

This guideline is directed at the control of parasites which are a major health burden worldwide. The spread of foodborne parasitic diseases is enhanced by changes in human behaviour, demographics, environment, climate, land use and trade, among other drivers. This document will provide guidance to all countries to prevent or minimise the transmission of parasites (or minimise the number of transmission stages).

4.2 Criteria applicable to general subjects**(a) Diversification of national legislation and apparent resultant or potential impediment to international trade**

N/A

(b) Scope of work and establishment of priorities between the various sections of the work

The main document should be developed first and the supporting annexes in a second time.

(c) Work already undertaken by other international organizations in this field and/or suggested by the relevant international intergovernmental body(ies)

OIE is working on a number of zoonotic parasites and relevant work will be taken into account.

¹ Preliminary Report, 24 Oct. 2012

(d) Amenability of the subject of the proposal to standardization

No problem is foreseen.

(e) Consideration of the global magnitude of the problem or issues

The risk of human infection with parasites is not restricted to distinct geographical areas and transmission can occur by ingesting fresh or processed foods that have been contaminated with the transmission stages via the environment, animals (often from their faeces), or people (often due to inadequate hygiene). Foodborne parasites can also be transmitted through the consumption of raw and undercooked or poorly processed meat and offal from domesticated animals, wild game, and fish containing infective tissue stages.

5. Relevance to the Codex strategic objectives

The proposed work directly relates to the following Codex Strategic Goals from the 2014-2019 Strategic Plan.

Goal 1: Establish international food standards that address current and emerging food issues.

This work addresses Objective 1.1: Establish new and review existing food standards, based on priorities of the CAC and Objective 1.2: Proactively identify emerging issues and member country needs and, where appropriate, develop relevant food standards.

The World Organisation for Animal Health (OIE) has, and is, reviewing chapters related to the surveillance and control of certain zoonotic parasite infections such as trichinellosis and echinococcosis/hydatidosis. The current work on the Guidelines for Control of Specific Zoonotic Parasites in Meat: *Trichinella* spp. and *Cysticercus bovis* highlighted the importance of strengthening the collaboration with OIE without overlapping with each other's responsibilities. This work is consistent with Objective 1.3: Strengthen coordination and cooperation with other international standards-setting organizations seeking to avoid duplication of efforts and optimize opportunities.

Goal 5: Facilitate the Effective Participations of all Codex Members

The development of this Guideline should generate interest and participation from all country members. It is anticipated that the parent document would be developed by an electronic working group and the subsequent development of the annexes be facilitated through pre-session CCFH working group meetings in year 2,3 and 4 of the development cycle.

6. Information on the relation between the proposal and other existing Codex documents

The Guideline will build on the General Principles of Food Hygiene (CAC/RCP 1-1969) and will be used in conjunction with it and other relevant Codes of practice such as *Code of Hygienic Practice for Fresh Fruits and Vegetables* (CAC/RCP 53-2003) and the *Code of Hygienic Practice for Meat* (CAC/RCP 58-2005) and the *Code of Practice for Fish and Fishery Products* (CAC/RCP 52-2003)

7. Identification of any requirement for and availability of expert scientific advice

We anticipate that there may be a need for scientific advice from FAO/WHO (JEMRA) on individual parasites particularly regarding transmission routes. This advice will inform the development of annexes.

8. Identification of any need for technical input to the standard from external bodies so that this can be planned for

Collaboration with OIE will be important to ensure the whole food chain approach.

9. The proposed time-line for completion of the new work, including the start date, the proposed date for adoption at Step 5, and the proposed date for adoption by the Commission.

Start date – new work approved by the Commission in 2014

Adoption at Step 5 – 2017

Adoption at Step 8 - 2019

Appendix VIII**CCFH FORWARD WORKPLAN**

| Ranking | Title of Work | Last revision | Currency of information | Positive impact of new work on public health | Project document/discussion paper | Public Health Risk | Trade Impact | Comments | FAO/WHO assistance needed | Total |
|---------|--|---------------|-------------------------|--|-----------------------------------|--------------------|--------------|------------------------|---------------------------|-------|
| 1 | Code of Hygienic Practice on the Control of Parasites in Food | | YES | YES | YES | 20 | 10 | | YES | 30 |
| 1 | Control of <i>Salmonella</i> in beef and pork | | YES | YES | YES | 20 | 10 | Need participation OIE | YES | 30 |
| 2 | <i>General Principles of Food Hygiene</i> (CAC/RCP 1-1969) Annex: Guidelines for the Application of HACCP Systems | 2003 | YES | YES | NO | 20 | 10 | | | 30 |
| 2 | <i>Code of Hygienic Practice for Meat</i> (CAC/RCP 58-2005) | | YES | YES | NO | 20 | 10 | | | 30 |
| 2 | Control of Verotoxigenic <i>E. coli</i> in beef | | YES | YES | NO | 20 | 10 | | | 30 |
| 3 | Development of an annex on tomatoes for the <i>Code of Hygienic Practice for Fresh Fruits and Vegetables</i> (CAC/RCP 53-2003) | | YES | YES | NO | 14 | 5 | | | 19 |
| 4 | Code of Hygienic Practice for the Storage of Cereals | | YES | NO | YES | 8 | 5 | | | 13 |

| Ranking | Title of Work | Last revision | Currency of information | Positive impact of new work on public health | Project document/discussion paper | Public Health Risk | Trade Impact | Comments | FAO/WHO assistance needed | Total |
|---------|--|---------------|-------------------------|--|-----------------------------------|--------------------|--------------|----------|---------------------------|-------|
| | <i>Code of Hygienic Practice for Fresh Fruits and Vegetables (CAC/RCP 53-2003)</i> | 2013 | NO | - | - | 20 | 10 | | | 30 |
| | <i>Code of Hygienic Practice for Milk and Milk Products (CAC/RCP 57-2004)</i> | | NO | - | - | 14 | 10 | | | 24 |
| | <i>Code of Hygienic Practice for Eggs and Egg Products (CAC/RCP 15-1976)</i> | 2007 | NO | - | - | 14 | 5 | | | 19 |
| | <i>Code of Hygienic Practice for Precooked and Cooked Foods in Mass Catering (CAC/RCP 39-1993)</i> | | NO | - | | 14 | 5 | | | 19 |
| | <i>Code of Hygienic Practice for the Transport of Food in Bulk and Semi-packed Food (CAC/RCP 47-2001)</i> | | NO | - | - | 8 | 10 | | | 18 |
| | <i>Code of Hygienic Practice for Low-acid and Acidified Canned Foods (CAC/RCP 23-1979)</i> <i>Code of Hygienic Practice for Aseptically Processed and Packaged Low-acid Foods (CAC/RCP 40-1993)</i> <i>Guideline Procedures for the Visual Inspection of Lots of Canned Foods for Unacceptable Defects</i> | 1993 | NO | - | - | 8 | 10 | | | 18 |

| Ranking | Title of Work | Last revision | Currency of information | Positive impact of new work on public health | Project document/discussion paper | Public Health Risk | Trade Impact | Comments | FAO/WHO assistance needed | Total |
|---------|---|---------------|-------------------------|--|-----------------------------------|--------------------|--------------|---|---------------------------|-------|
| | (CAC/GL 17-1993) <i>Code of Hygienic Practice for Canned Fruit and Vegetable Products</i> (CAC/RCP 2-1969) | | | | | | | | | |
| | Development of an annex on carrots for the <i>Code of Hygienic Practice for Fresh Fruits and Vegetables</i> (CAC/RCP 53-2003) | | NO | - | - | 8 | 5 | | | 13 |
| | <i>Code of Hygienic Practice for Bottled/Packaged Drinking Waters (other than natural mineral waters)</i> (CAC/RCP 48-2001) | 2001 | NO | - | - | 8 | 5 | | | 13 |
| | <i>Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf-life</i> (CAC/RCP 46-1999) | 1999 | NO | - | - | 8 | 5 | | | 13 |
| | <i>Code of Hygienic Practice for the Processing of Frog Legs</i> (CAC/RCP 30-1983) | | NO | - | - | 8 | 2 | CL on new work to request input on whether to keep or revoke this code. | | 10 |

Appendix IX**PROCESS BY WHICH THE CODEX COMMITTEE ON FOOD HYGIENE (CCFH)
WILL UNDERTAKE ITS WORK****Purpose**

1. The following guidelines are established to assist the CCFH to:
 - Identify, prioritize and efficiently carry out its work; and
 - Interact with FAO/WHO and their scientific bodies as the need arises.

Scope

2. These guidelines apply to all work undertaken by the CCFH and encompass: guidelines and procedures for proposing new work (including the revision of existing codes of hygienic practice); criteria and procedures for considering the priorities for proposed and existing work; procedures for implementing new work; and a process by which CCFH will obtain scientific advice from FAO/WHO.

Proposals for New Work

3. Proposals for new work to be undertaken by CCFH should follow the process outline below. In addition to the provisions applying to proposals for new work in the Procedural Manual, the proposals for new work should include a Risk Profile¹, as appropriate. The proposals for new work should indicate the specific nature or outcome of the new work being proposed (e.g. new or revised code of hygienic practice, risk management guidance document).
4. The proposals for new work will typically address a food hygiene issue of public health significance. It should describe in as much detail as possible, the scope and impact of the issue and the extent to which it impacts on international trade.
5. The proposal for new work may also:
 - Address an issue that affects progress within CCFH or by other committees, provided it is consistent with the mandate of CCFH;
 - Facilitate risk analysis activities; or
 - Establish or revise general principles or guidance. The need to revise existing CCFH texts may be to reflect current knowledge and/or improve consistency with the *General Principles of Food Hygiene* (CAC/RCP 1-1969).

Criteria for Evaluating and Prioritizing New Work

6. In addition to the provisions applying to the proposals for new work contained in the *Codex Procedural Manual*, the following criteria and associated weighting factors will be used in evaluating new work priorities to assist in determining the priority for new work to be undertaken by CCFH. Standards older than five years or those with duplication or inconsistency with existing codes should also be assessed by the criteria below to determine their need for revision.

¹ Definition of a risk profile is “the description of the food safety problem and its context” (Codex Alimentarius Commission, *Procedural Manual*). The elements of a risk profile are provided in the *Principles and Guidelines for the Conduct of Microbiological Risk Management* (CAC/GL 63-2007).

| Criterion | Rating |
|---|---|
| Currency of Information – <ul style="list-style-type: none"> Is there new information/data that would justify the need to review the existing code(s) or establish a new one? Are there new technologies that would justify the need to review existing codes or establish a new one? | Yes/No |
| Positive impact of new work on public health - whether new work would result in a document that could have a positive impact on public health | Yes/No |
| Public health risk, e.g. foodborne risk to public health | High 20 Medium 14 Low 8 |
| Impact of trade due to the public health risk | Global Trade Impact, High Consumption: 10 Regional Trade Impact, High Consumption: 5 Global Trade Impact, Low Consumption: 4 Regional Trade Impact, Low Consumption: 2 No trade impact: 0 |

*Risk² is defined as a function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard in food. The hazard may be a biological, chemical or physical agent in, or condition of, food that has the potential to cause an adverse health effect. The public health risk should be based on documented convincing or probable scientific evidence of adverse health effects or potential adverse health effects including morbidity and/or mortality due to a biological, chemical or physical agent in, or condition of the food. The *Working Principles for Risk Analysis for Application in the Framework of the Codex Alimentarius*³ should be referenced when determining the public health risk.

Process for Considering Proposals for New Work

7. To facilitate the process of managing the work of the Committee, CCFH may establish an *ad hoc* Working Group for the Establishment of CCFH Work Priorities (“*ad hoc* Working Group”) at each Session, in accordance with the Guidelines on Physical Working Groups.

8. The Committee on Food Hygiene will, normally, employ the following process for undertaking new work.

- i. A request for proposals for new work and/or revision of an existing standard will be issued in the form of a Codex Circular Letter, if required.
- ii. Proposals for new work received in response to the Codex Circular Letter will be transmitted to the Host of the *ad hoc* Working Group as well as the CCFH Host government and Codex Secretariats.
- iii. The Host of the *ad hoc* Working Group will collate the proposals for new work in a document that will be distributed by the Codex Secretariat to Codex members and observers for review and comment within a specified time frame.
- iv. The *ad hoc* Working Group will meet as decided by the Committee, normally on the day prior to the plenary session of CCFH to develop recommendations for consideration by the Committee during the CCFH session. The *ad hoc* Working Group will review the proposals for new work along with comments submitted. It will verify the completeness and compliance with the prioritization criteria of the proposals for new work and make recommendations to the Committee on whether the proposals for new work should be accepted, denied, or returned for additional information.
- v. If accepted, a recommendation will be provided on the priority of the proposal for new work compared to pre-established priorities. The priority of the proposals for new work will be established using the guidelines presented above. Proposals for new work of lower priority may be delayed if resources are limiting. Proposals for new work of lower priority not recommended may be reconsidered at the next CCFH session. If the *ad hoc* Working Group recommends that a proposal for new work be “denied” or “returned for revision,” a justification for this recommendation will be provided.

² Codex Procedural Manual

- vi. At the CCFH session, the *ad hoc* Working Group Chair will introduce the recommendations of the *ad hoc* Working Group to the Committee. The CCFH will decide whether a proposal for new work and/or revision of an existing standard is accepted, returned for revision, or denied. If accepted, a project document³, which may include amendments agreed upon by the Committee, will be prepared by the CCFH and submitted to the Codex Alimentarius Commission (CAC) with a request for approval of the proposed new work.
- vii. The CCFH Workplan (see below) will be updated at each meeting of the *ad hoc* Working Group in order to maintain continuity and a historical record of CCFH's consideration of new work.

CCFH Workplan

9. CCFH will maintain a forward-looking Workplan that will include new work proposals and, for the purpose of review, existing codes. The Workplan will list work in priority order based upon decisions made by CCFH and using the criteria for evaluating and prioritizing work (see above). The Workplan will be reviewed by the *ad-hoc* Working Group at each Session of CCFH when prioritizing proposals for new work. CCFH will progressively work down the prioritized list of items contained in the Workplan. CCFH may reassess the priority of each item on the Workplan; where new data or other information is available relating to an item on the workplan, such data may be submitted for consideration and the priority for the work item reconsidered. It is intended for the Workplan to continue from Session to Session, updated and revised as appropriate based on CCFH's criteria for undertaking new work. If items are moved forward as new work, each item will require a Project Document and a clear indication of how the work is to be progressed (e.g. nominated delegation to lead work, use of a working group process).

Obtaining Scientific Advice

10. There are instances where progress on the work of the Committee will require an international risk assessment or other expert scientific advice. This advice will be typically be sought through FAO/WHO (e.g., through JEMRA, *ad hoc* expert consultations), though in certain instances such advice may be requested from other specialized international scientific bodies. When undertaking such work, the Committee should follow the structured approach given in the *Principles and Guidelines for the Conduct of Microbiological Risk Management* (CAC/GL 63-2007) and the *Working Principles for Risk Analysis for Application in the Framework of the Codex Alimentarius*.⁴

11. In seeking an international risk assessment to be conducted by FAO/WHO (e.g. through JEMRA), CCFH should consider and seek advice on whether:

- i. Sufficient scientific knowledge and data to conduct the needed risk assessment are available or obtainable in a timely manner. (An initial evaluation of available knowledge and data will typically be provided within the Risk Profile.)
- ii. There is a reasonable expectation that a risk assessment will provide results that can assist in reaching risk management decisions related to control of the microbiological hazard without unduly delaying the adoption of the needed microbiological risk management guidance.
- iii. Risk assessments performed at the regional, national and multinational levels that can facilitate the conduct of an international risk assessment are available.

12. If the Committee decides to request that a microbiological risk assessment or other scientific advice be developed, the Committee will forward a specific request to FAO/WHO, the risk profile document (where available), a clear statement of the purpose and scope of the work to be undertaken, any time constraints facing the Committee that could impact the work, and in the case of a risk assessment, the specific risk management questions to be addressed by the risk assessors. The Committee will, as appropriate, also provide FAO/WHO with information relating to the risk assessment policy for the specific risk assessment work to be undertaken. FAO/WHO will evaluate the request according to their criteria and subsequently inform the Committee of its decision on whether or not to carry out such work together with a scope of work to be undertaken. If FAO/WHO responds favourably, the Committee will encourage its members to submit their relevant scientific data. If a decision is made by FAO/WHO not to perform the requested risk assessment, FAO/WHO will inform the Committee of this fact and the reasons for not undertaking the work (e.g. lack of data, lack of financial resources).

13. The Committee recognizes that an iterative process between risk managers and risk assessors is essential throughout the process described above and for the adequate undertaking of any microbiological risk assessment and the development of any microbiological risk management guidance document or other CCFH document(s).

14. The FAO/WHO will provide the results of the microbiological risk assessment(s) or other expert scientific advice to the Committee in a format and fashion to be determined jointly by the Committee and FAO/WHO. As needed, the FAO/WHO will provide scientific expertise to the Committee, as feasible, to provide guidance on the appropriate interpretation of the risk assessment.

³ The elements of a project document are described in the Codex Alimentarius Commission, *Procedural Manual*.

⁴ Codex Alimentarius Commission, *Procedural Manual*.

15. Microbiological risk assessments carried out by FAO/WHO (JEMRA) will operate under the framework contained in the *Principles and Guidelines for the Conduct of Microbiological Risk Assessment* (CAC/RCP 30-1999).