



JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEx COMMITTEE ON FOOD HYGIENE

Fifty-fifth Session

Nashville, Tennessee, United States of America

15–19 December 2025

ALIGNMENT OF CODEx TEXTS DEVELOPED BY CCFH WITH THE REVISED *GENERAL PRINCIPLES OF FOOD HYGIENE* (CXC 1-1969)

(Prepared by the Electronic Working Group chaired by China
and co-chaired by the United Kingdom and the European Union)

Codex Members and Observers wishing to submit comments on the discussion paper should do so as instructed in CL 2025/59/FH available on the Codex webpage/Circular Letters 2025: <https://www.fao.org/fao-who-codexalimentarius/resources/circular-letters/pt/>

BACKGROUND

1. At its 54th Session, the Codex Committee on Food Hygiene (CCFH54) agreed to prioritize the work on alignment of its existing texts with the *General Principles of Food Hygiene* (CXC 1-1969) and to integrate this activity into its workplan.¹ CCFH54 further agreed to adopt a hybrid approach to alignment. Under this approach, texts undergoing technical revision or included in Part 1 of the Forward Workplan would be structurally aligned with CXC 1-1969 by the respective electronic working groups (EWGs), while texts listed in Part 2 of the Forward Workplan requiring alignment would be aligned by a dedicated alignment EWG.²
2. To implement this decision, CCFH54 established an EWG on alignment, chaired by China and co-chaired by the United Kingdom and the European Union.³ The EWG was tasked to initiate the structural alignment work, beginning with the most recently modified texts, and to establish a timeframe for completing alignment with the *General Principles of Food Hygiene* (CXC 1-1969). The EWG was also requested to identify any challenges encountered in structural alignment and, where feasible, provide recommendations on how these might be addressed for consideration by CCFH55.

INTRODUCTION

3. In line with the mandate given by CCFH54, the EWG (The list of participants can be found in Appendix V) on alignment reviewed the Codex texts listed in Appendix VII of the CCFH54 report to assess their suitability for full structural alignment with the *General Principles of Food Hygiene* (CXC 1-1969). The EWG conducted its work following the agreed structural alignment approach and under the terms of reference set by CCFH54.
4. The present document summarizes the progress made by the EWG on alignment. It provided the proposed structurally aligned texts and highlighted issues or challenges identified during the alignment process. Where appropriate, the document also presents recommendations for consideration by CCFH55 regarding the next steps to advance the alignment work.

SCOPE AND OBJECTIVE

5. The scope of this work is limited to the structural alignment of Codex texts under the responsibility of CCFH that are listed in Appendix VII of the CCFH54 report and identified for alignment under Part 2 of the Forward Workplan.⁴ The objective is to ensure that these texts are harmonized with the structure and main headings of the *General Principles of Food Hygiene* (CXC 1-1969), while maintaining the integrity and intent of their technical content.
6. The alignment process aims to:

¹ REP24/FH, paragraph 176

² REP24/FH, paragraph 176(ii)(b)

³ REP24/FH, paragraph 177

⁴ EP24/FH, Appendix VII

- ensure consistency of structure and terminology across CCFH texts;
- facilitate ease of use and understanding of the documents by Codex Members and Observers;
- identify and document any challenges or limitations encountered during alignment (e.g., due to the age, structure, or technical content of the text); and
- propose recommendations to address such challenges, as appropriate, for the consideration of CCFH55.

WORK UNDERTAKEN BY THE EWG

- Following the mandate from CCFH54, the EWG initiated its work by reviewing the texts listed in Appendix VII of the CCFH54 report to determine their suitability for full structural alignment with CXC 1-1969.⁵ Priority was given to the 3 most recently revised documents, in line with the guidance from CCFH54, i.e., *Guidelines for the Control of Taenia Saginata in Meat of Domestic Cattle* (CXG 85-2014), *Guidelines for the Control of Trichinella Spp. in Meat of Suidae* (CXG 86-2015) and *Guidelines on the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites* (CXG 88-2016).
- The EWG developed an agreed alignment approach to ensure consistency and transparency in the process, including:
 - reviewing the structure of each text against the main headings of CXC 1-1969;
 - inserting cross-references where relevant sections correspond to CXC 1-1969, including Sections 16–19 (HACCP) that were absent in earlier versions of the texts;⁶
 - identifying cases where full structural alignment was not feasible due to unique structure, scope, or outdated provisions; and
 - documenting specific challenges and proposed solutions for consideration by the Committee.
- During the alignment, the EWG also maintained communication with the working group on the new work and forward workplan, to ensure coordination and consistency across related activities. Draft aligned texts and related questions were circulated among EWG members for review and comment. Based on the feedback received, the EWG prepared the revised versions of the aligned texts (Appendices I, II, III) and compiled key issues or considerations in the EWG discussion (Appendix IV). The proposed workplan for the future alignment of CCFH texts with CXC 1-1969 is presented as Appendix VI.
- The present document reflects the outcomes of these discussions. Sections where agreement was reached have been aligned in accordance with the agreed approach. Where divergent views or specific comments were raised, square brackets have been used in the revised text to indicate matters requiring further consideration by CCFH55.
- For clarity and readability, the aligned texts were presented in clean, finalized form rather than using track changes. This approach allowed CCFH55 to review the proposed structure and content without the distraction of mark-ups, while any areas where divergent views or issues remain were indicated using square brackets for the Committee's attention. Footnotes or references to CXC 1-1969 have been retained where appropriate to facilitate cross-referencing.

SUMMARY OF KEY ISSUES AND CHALLENGES IDENTIFIED

- During the alignment process, the EWG identified several issues that affected the extent to which full structural alignment with the *General Principles of Food Hygiene* (CXC 1-1969) could be achieved. These challenges generally fell into the following categories:

Structural differences between existing texts and CXC 1-1969

- Some older documents follow a format that does not fully correspond to the main headings of CXC 1-1969. In such cases, the EWG considered how best to reflect equivalent content.

Overlapping or missing content

- In certain instances, the aligned text contained provisions that overlapped with or partially repeated guidance already present in CXC 1-1969. Conversely, some sections lacked content corresponding to newer provisions introduced in later revisions of CXC 1-1969, such as those related to HACCP principles (Sections 16–19).⁷

⁵ REP24/FH, Appendix VII

⁶ REP24/FH, paragraph 177(i)(d)

⁷ REP24/FH, paragraph 177(i)(d)

Variation in terminology and scope

15. Different texts use terms or definitions that predate recent Codex updates or differ from those used in CXC 1-1969. The EWG noted that in these cases, structural alignment could proceed without altering terminology, but further technical review may be needed at a later stage to ensure consistency across Codex texts.

Divergent member views

16. In a limited number of cases, EWG members held different opinions on the most appropriate way to align or reference certain sections. These differences have been reflected in the revised texts using square brackets for CCFH55's consideration.

RECOMMENDATIONS

17. In view of the progress made and the challenges identified, the EWG on alignment proposes the following recommendations for consideration by CCFH55:
 - i. **Endorsement of the alignment approach.** CCFH55 is invited to endorse the alignment approach applied by the EWG, which follows the guidance provided by CCFH54 and ensures consistency with the structure and main headings of the *General Principles of Food Hygiene* (CXC 1-1969) (See paragraph 8).
 - ii. **Consideration of aligned texts.** CCFH55 is invited to review the proposed aligned texts presented in the Appendices I, II and III to this document. For sections where consensus was reached, the EWG recommends that CCFH55 confirm the alignment. For sections enclosed in square brackets, CCFH55 is invited to provide further guidance or reach agreement on the preferred wording or structural approach.
 - iii. **Guidance on unresolved issues.** CCFH55 may wish to provide guidance on how to address cases where full structural alignment was not feasible due to structural, historical, or scope-related reasons, including under what circumstances, additional technical review or limited revision should be undertaken.
 - iv. **Continuation of alignment work.** CCFH55 is invited to consider extending the mandate of the EWG on alignment to continue the structural alignment of remaining texts listed under Part 2 of the Forward Workplan, and to update the alignment approach as needed based on the outcomes of CCFH55.

Appendix I: Draft Aligned *Guidelines for the Control of Taenia saginata in Meat of Domestic Cattle* (CXG 85-2014)⁸

Appendix II: Draft Aligned *Guidelines for the Control of Trichinella Spp. in Meat of Suidae* (CXG 86-2015)⁸

Appendix III: Draft Aligned *Guidelines on the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites* (CXG 88-2016)⁸

Appendix IV: Key Issues or Considerations in the EWG Discussion

Appendix V: List of participants of the EWG

Appendix VI: Proposed Workplan for the Future Alignment of CCFH Texts with CXC 1-1969

⁸ In Appendices I, II, and III, amendments according to additional individual comments are highlighted in yellow; cross-references for which updates are not available are highlighted in gray; and amendments incorporating the suggested changes to CXG 86-2015 in CX/FH 25/55/2 are highlighted in blue.

Appendix I

Draft Aligned Guidelines for the Control of Taenia Saginata in Meat of Domestic Cattle (CXG 85-2014)**1. INTRODUCTION**

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.

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 report⁹). 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.

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.

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.

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

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.

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 trade¹⁰.

3. SCOPE

These Guidelines, used in conjunction with *FAO/WHO/OIE Guidelines for the Surveillance, Prevention and Control of Taeniasis/Cysticercosis*¹¹ ("*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*

⁹ <http://www.fao.org/food/food-safety-quality/a-z-index/foodborne-parasites/en>

¹⁰ *Guidelines on the Judgement of Equivalence Sanitary Measures associated with Food Inspection and Certification Systems* (CXG 53-2003)

¹¹ FAO/WHO/OIE Guidelines for the Surveillance, Prevention and Control of Taeniasis/Cysticercosis (<https://openknowledge.fao.org/server/api/core/bitstreams/3e3980c4-0795-4a40-b47f-30a897a928b3/content>)

Hygienic Practice for Meat (CXC 58-2005) that provides generic advice on a risk-based approach to meat hygiene.

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.

4. USE

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* (CXC 1-1969), the *Code of Hygienic Practice for Meat* (CXC 58-2005) and the *FAO/WHO/OIE Guidelines on Taeniasis*.

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

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.

5. GENERAL PRINCIPLES

Refer to Section 5 of the *General Principles of Food Hygiene* (CXC 1-1969), in addition:

Overarching principles for good hygienic practice for meat are presented in the *Code of Hygienic Practice for Meat* (CXC 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. DEFINITIONS

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.

GOOD HYGIENE PRACTICES

7. INTRODUCTION AND CONTROL OF FOOD HAZARDS

Refer to Section 7 of the *General Principles of Food Hygiene* (CXC 1-1969), in addition:

7.1 Identification of a food safety issue

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.

7.2 Risk Profile

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 FAO¹² and WHO¹³ websites.

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.

8. PRIMARY PRODUCTION

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-to-consumption" food chain continuum.

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

9. ESTABLISHMENT – DESIGN OF FACILITIES AND EQUIPMENT

Refer to Section 9 of the *General Principles of Food Hygiene* (CXC 1-1969).

10. TRAINING AND COMPETENCE

Refer to Section 10 of the *General Principles of Food Hygiene* (CXC 1-1969) and in addition:

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.

11. ESTABLISHMENT MAINTENANCE, CLEANING AND DISINFECTION, AND PEST CONTROL

Refer to Section 11 of the *General Principles of Food Hygiene* (CXC 1-1969).

12. PERSONAL HYGIENE

Refer to Section 12 of the *General Principles of Food Hygiene* (CXC 1-1969).

13. CONTROL OF OPERATION

Refer to Section 13 of the *General Principles of Food Hygiene* (CXC 1-1969), in addition:

[13.1 Description of products and processes]

Refer to Section 13.1 of the *General Principles of Food Hygiene* (CXC 1-1969), in addition:]

13.1.1 Monitoring and corrective action

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.

[13.2 Key aspects of GHPs]

Refer to Section 13.2 of the *General Principles of Food Hygiene* (CXC 1-1969)

¹² <http://www.fao.org/food/food-safety-quality/a-z-index/foodborne-parasites/en/>

¹³ <https://www.who.int/publications/i/item/9789241564700>

13.3 Water

Refer to Section 13.3 of the *General Principles of Food Hygiene* (CXC 1-1969)

13.4 Documentation and records

Refer to Section 13.4 of the *General Principles of Food Hygiene* (CXC 1-1969)

13.5 Recall procedures – removal from the market of unsafe food

Refer to Section 13.5 of the *General Principles of Food Hygiene* (CXC 1-1969)

13.6 Post mortem inspection

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.

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.

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

13.6.1 Alternative inspection procedures

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.

13.6.2 Treatment of meat

Temperature treatment (heating and freezing) at regimes that ensure lethality for *T. saginata* is an available routine preventative control measure¹⁴. 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.

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).

13.6.3 Traceability for slaughtered cattle

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.

13.7 Selection of risk-based control measures

13.7.1 Risk-based approach

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

¹⁴ 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). <https://www.who.int/publications/i/item/WHO-FNU-FOS-95.12>

- 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.

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.

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.

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.

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.

14. PRODUCT INFORMATION AND CONSUMERS AWARENESS

Refer to Section 14 of the *General Principles of Food Hygiene* (CXC 1-1969) and in addition:

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

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.

15. TRANSPORTATION

Refer to Section 15 of the *General Principles of Food Hygiene* (CXC 1-1969).

HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) SYSTEM AND GUIDELINES FOR ITS APPLICATION

16. INTRODUCTION TO HACCP

Refer to Section 16 of the *General Principles of Food Hygiene* (CXC 1-1969).

17. PRINCIPLES OF THE HACCP SYSTEM

Refer to Section 17 of the *General Principles of Food Hygiene* (CXC 1-1969).

18. GENERAL GUIDELINES FOR THE APPLICATION OF THE HACCP SYSTEM

Refer to Section 18 of the *General Principles of Food Hygiene* (CXC 1-1969).

19. APPLICATION

Refer to Section 19 of the *General Principles of Food Hygiene* (CXC 1-1969).

Appendix II

Draft Aligned Guidelines for the Control of *Trichinella* Spp. in Meat of Suidae (CXG 86-2015)**1. INTRODUCTION**

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.

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

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* (CXG 63-2007)) such as:

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

2. OBJECTIVES

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.

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 equivalence¹⁵ by importing countries, thereby facilitating international trade.

3. SCOPE

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.

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*¹⁶ and the *Code of Hygienic Practice for Meat* (CXC 58-2005) that provides generic advice on a risk-based approach to meat hygiene.

These Guidelines used in conjunction with the WOA recommendations ([chapter on Infection with *Trichinella* spp.](#) of the WOA *Terrestrial Animal Health Code*), apply to all steps from primary production to consumption.

4. USE

These Guidelines, used in conjunction with the WOA recommendations ([chapter on Infection with *Trichinella* spp.](#) of the WOA *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.

¹⁵ *Guidelines on the Judgement of Equivalence Sanitary Measures associated with Food Inspection and Certification Systems* (CXG 53-2003)

¹⁶ <http://www.fao.org/DOCREP/006/Y4800E/y4800e0o.htm>

The Guidelines are supplementary to and should be used in conjunction with the *General Principles of Food Hygiene* (CXC 1-1969), the *Code of Hygienic Practice for Meat* (CXC 58-2005), the *Code of Practice for the Processing and Handling of Quick Frozen Foods* (CXC 8-1976), the *FAO/WHO/OIE Guidelines for the Surveillance, Management, Prevention and Control of Trichinellosis*¹⁷ and the *Recommendations on Methods for the Control of Trichinella in Domestic and Wild Animals Intended for Human Consumption* prepared by the International Commission on Trichinellosis (ICT) Standards for Control Guidelines Committee¹⁸.

The diagnostic techniques referred to in these Guidelines are those of the *WOAH Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* ([chapter on Trichinellosis \(infection with *Trichinella* spp\)](#)).

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 equivalence¹⁹ of different food safety measures for meat of Suidae in different countries for international trade purposes.

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 [the chapter on Infection with *Trichinella* spp.](#) of the *WOAH Terrestrial Animal Health Code*.

[4.1 Roles of competent authorities, food business operators, and consumers]

Refer to Section 4.1 of the *General Principles of Food Hygiene* (CXC 1-1969).]

5. GENERAL PRINCIPLES

Refer to Section 5 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

Overarching principles for good hygienic practice for meat are presented in the *Code of Hygienic Practice for Meat* (CXC 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 recognize 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.

[5.1 Management commitment to food safety]

Refer to Section 5.1 of the *General Principles of Food Hygiene* (CXC 1-1969).]

6. DEFINITIONS

For the purpose of this document, the following definitions apply:

Compartment²⁰ means an animal subpopulation contained in one or more establishments, separated from other susceptible populations by a common biosecurity management system, with a specific animal health status with respect to one or more infections or infestations for which the necessary surveillance, biosecurity and control measures have been applied for the purposes of international trade or disease prevention and control in a country or zone.

¹⁷ http://www.trichinellosis.org/uploads/FAO-WHO-OIE_Guidelines.pdf

¹⁸ <http://www.med.unipi.it/ict/ICT%20Recommendations%20for%20Control.English.pdf>

¹⁹ *Guidelines on the Judgement of Equivalence Sanitary Measures associated with Food Inspection and Certification Systems* (CXG 53-2003)

²⁰ Definition in the [Glossary of the](#) *WOAH Terrestrial Animal Health Code*.

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 *Trichinella* spp. to domestic pigs in a region or country.

GOOD HYGIENE PRACTICES

7. INTRODUCTION AND CONTROL OF FOOD HAZARDS

Refer to Section 7 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

7.1 Availability and selection of risk-based control measures.

7.1.1 Availability of control measures at herd level

Measures to prevent *Trichinella* infection in domestic pig herds and to establish a compartment of negligible risk are described in [the chapter on Infection with Trichinella spp.](#) of the WOA *Terrestrial Animal Health Code*.

7.1.2 Availability of post-slaughter control measures

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 measures²¹ when there is relevant information that can be verified by the competent authority.

Inactivation of *Trichinella* spp. by curing should follow the recommendations of ICT²².

7.1.2.1 Laboratory testing and follow-up actions

When laboratory tests are performed on individual carcasses, those selected analytical methods should be in accordance with the diagnostic techniques recommended in [the chapter on Trichinellosis \(infection with Trichinella spp.\)](#) of the WOA *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* (digestion assays) and the ICT *Recommendations for Quality Assurance in Digestion Testing Programmes for Trichinella*²³ or ISO/CEN standards.

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.

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.

7.1.2.2 Freezing

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.

²¹ http://www.aesan.msssi.gob.es/AESAN/docs/docs/evaluacion_riesgos/comite_cientifico/ingles/TRICHINELLA_SUCKLING_PIG.pdf

²² Validated methods for curing are currently under development by ICT

²³ http://www.trichinellosis.org/uploads/Part_1_final_-_QA_Recomendations_7Feb2012.pdf

7.1.2.3 Heat treatment or irradiation

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* (CXS 106-1983) and the *Code of Practice for Radiation Processing of Food* (CXC 19-1979).

7.1.3 Selection of risk-based control measures

With the establishment of the negligible risk compartment as described in [the chapter on Infection with *Trichinella* spp.](#) of the WOA *Terrestrial Animal Health Code*, including consideration of the level of public health protection provided, the competent authority may provide derogation from specific post-slaughter controls or change the level of application of specific post-slaughter controls.²⁴

7.2 Preliminary risk management activities

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.

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 Control of Trichinellosis* has been published.
- Evaluation of the epidemiological evidence supporting a negligible risk claim for domestic pigs consumed domestically or abroad.

7.3 Implementation of risk-based measures

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

8. PRIMARY PRODUCTION

Refer to Section 8 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

[8.5] Non-domesticated suidae, feral pigs and cross-breeds

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 [chapter on Trichinellosis \(infection with *Trichinella* spp.\)](#) of the WOA *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 [the relevant section in the chapter on "Trichinellosis \(Infection with *Trichinella* spp.\)](#) of the WOA *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*, validated and approved for post-slaughter control in these animals.

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

9. Establishment – design of facilities and equipment

Refer to Section 9 of the *General Principles of Food Hygiene* (CXC 1-1969).

10. Training and competence

²⁴ Illustrations of the levels of public health protection that can be achieved when establishing a compartment with negligible risk are provided by FAO and WHO. (https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FMeetings%252FCX-712-46%252FREP15_FHe.pdf).

Refer to Section 10 of the *General Principles of Food Hygiene* (CXC 1-1969).

11. Establishment maintenance, cleaning and disinfection, and pest control

Refer to Section 11 of the *General Principles of Food Hygiene* (CXC 1-1969).

12. PERSONAL HYGIENE

Refer to Section 12 of the *General Principles of Food Hygiene* (CXC 1-1969).

13. CONTROL OF OPERATION

Refer to Section 13 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

[13.1 Description of products and processes]

Refer to Section 13.1 of the *General Principles of Food Hygiene* (CXC 1-1969), in addition:]

13.1.1 Monitoring and corrective action

After establishing a negligible risk compartment according to the chapter on Infection with *Trichinella spp.* of the WOA *Terrestrial Animal Health Code*, ongoing assurance of public health protection should be based on avoiding *Trichinella spp.* contaminated meat from going into commerce. Public health protection can be assured by:

- a) a review of evidence, in particular from audits of herds, demonstrating compliance with the conditions as described in the relevant article of the chapter on infection with *Trichinella spp.* of the WOA *Terrestrial Animal Health Code*; or
- b) a risk based slaughter surveillance programme that takes into account information from historical testing results and is supplemented by regular review of information from audits of herds within the compartment; or
- c) a slaughter surveillance programme incorporating current testing data demonstrating that prevalence of infection does not exceed 1 infected carcass per 1,000,000 pigs slaughtered with at least 95% confidence.

In addition to the above, epidemiological investigation of human trichinellosis cases to confirm that the source of the contaminated meat was not from a negligible risk compartment in accordance with the chapter on Infection with *Trichinella spp.* of the WOA *Terrestrial Animal Health Code* should be conducted to the extent possible.

Where applicable and available, slaughter and any other relevant data from outdoor pigs and wild animals can provide additional information on the conditions surrounding the negligible risk compartment and the potential for infection of animals within the compartment.

[13.2 Key aspects of GHPs]

Refer to Section 13.2 of the *General Principles of Food Hygiene* (CXC 1-1969)

13.3 Water

Refer to Section 13.3 of the *General Principles of Food Hygiene* (CXC 1-1969)

13.4 Documentation and records

Refer to Section 13.4 of the *General Principles of Food Hygiene* (CXC 1-1969)

13.5 Recall procedures – removal from the market of unsafe food

Refer to Section 13.5 of the *General Principles of Food Hygiene* (CXC 1-1969)]

14. PRODUCT INFORMATION AND CONSUMER AWARENESS

Refer to Section 14 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

[14.1] RISK COMMUNICATION

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.

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.

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.

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

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.

15. TRANSPORTATION

Refer to Section 15 of the *General Principles of Food Hygiene* (CXC 1-1969).

HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) SYSTEM AND GUIDELINES FOR ITS APPLICATION

16. INTRODUCTION TO HACCP

Refer to Section 16 of the *General Principles of Food Hygiene* (CXC 1-1969).

17. PRINCIPLES OF THE HACCP SYSTEM

Refer to Section 17 of the *General Principles of Food Hygiene* (CXC 1-1969).

18. GENERAL GUIDELINES FOR THE APPLICATION OF THE HACCP SYSTEM

Refer to Section 18 of the *General Principles of Food Hygiene* (CXC 1-1969).

19. APPLICATION

Refer to Section 19 of the *General Principles of Food Hygiene* (CXC 1-1969).

Draft Aligned Guidelines on the Application of General Principles of Food Hygiene to the Control of Foodborne Parasites (CXG 88-2016)

1. INTRODUCTION

Foodborne parasites are a major public health burden worldwide²⁵, particularly in areas with poor sanitary facilities and in populations that traditionally consume raw and undercooked food dishes. Infections may have prolonged, severe, and sometimes fatal outcomes, and result in considerable hardship in terms of food safety, security, quality of life, and negative impacts on livelihood.

The joint Food and Agriculture Organization of the United Nations (FAO)/ World Health Organization (WHO) report on Multicriteria-Based Ranking for Risk Management of Foodborne Parasites²⁶ lists 24 parasite species, genera or families that ranked highest in global public health concern. The top 8 highly ranked parasites are *Taenia solium*, *Echinococcus granulosus*, *Echinococcus multilocularis*, *Toxoplasma gondii*, *Cryptosporidium* spp., *Entamoeba histolytica*, *Trichinella* spp, and Opisthorchiidae. The ranking was based on 7 criteria of which 5 were public health related. The ranking was based on worldwide impacts and regionally other foodborne parasites may be more important. The ranking indicates that the foodborne parasites of greatest concern from a global public health perspective are not limited to a single parasite group or a food vehicle, but span a number of different parasites groups, and food vehicles.

Knowledge of parasite life cycles, transmission routes and environmental requirements is needed to understand which control measures may be effective. Foodborne parasites are transmitted to humans by ingestion of fresh or processed foods that are contaminated as a consequence of the parasite's life cycle (e.g. meat that contains *Trichinella* larvae or *Toxoplasma* tissue cysts) or that are contaminated with soil or water carrying infective stages of parasites (e.g. cysts, oocysts, eggs). In the first case, human infection can occur through the consumption of an infective stage in raw, undercooked or poorly processed meat and offal from domesticated animals, game, fish, crustaceans, cephalopods and molluscan shellfish. In the second case, human infection can occur from ingestion of infective stages in water and on foods such as fresh fruit and vegetables resulting from animal or human faecal contamination (e.g. oocysts of *Cryptosporidium* spp. in fresh vegetables).

Control of foodborne parasites can be achieved through the prevention of infection of farmed food animals (e.g. livestock, poultry, fish) with infective stages, the prevention of contamination of fresh and processed foods with infective stages, and/or the inactivation of parasites in or on foods during processing. Control during primary production is important for many parasite/food combinations, while control measures during post-harvest are necessary for other parasite/food combinations. During a parasite hazard analysis, producers should consider how the product will be further processed, prepared and consumed in order to determine appropriate parasite control measures. Education and awareness-raising are important components of consumer protection from foodborne parasitic diseases and, in many cases, may be the only feasible option available.

The first step of foodborne parasite risk management should be identifying any potential parasite hazard(s) applicable to the food being produced²⁷. The details of the epidemiology (both human and animal disease) and the life cycle of each parasite are essential in the identification, prevention and control of the risks associated with that parasite. Epidemiological data collection in food and environmental parasite surveys can be effective in identifying hazards and collecting information to be used for risk management strategy decisions. Surveillance for parasitic diseases in humans is complicated by the often prolonged incubation periods, sub-clinical nature, unrecognized chronic sequelae and lack of easily available diagnostic procedures.

The occurrence and distribution of parasitic species in the raw commodities used for food can be affected by climate changes, land use, and other environmental factors. The spread of foodborne parasitic diseases is

²⁵ WHO FERG report (2015)

²⁶ FAO/WHO. 2014. Multicriteria-based ranking for risk management of food-borne parasites. Microbiological Risk Assessment Series No. 23. Available at <http://www.fao.org/3/a-i3649e.pdf> and <https://www.who.int/publications/item/9789241564700>

²⁷ Principles and Guidelines for the conduct of Microbiological Risk Management (MRM) (CXG 63-2007).

also affected by human behaviour (for instance, environmental contamination by human faeces due to the lack of latrines and human-to-human contact that spread parasite eggs and cysts), demographics, and global trade. For example, globalization of food trade offers new opportunities for parasite dissemination into new area.

2. OBJECTIVES

The primary purpose of these guidelines is to provide guidance on preventing, reducing, inactivating, or otherwise controlling foodborne parasite hazards that present a public health risk. The guidelines provide science-based advice to governments and the food industry with the aim of protecting the health of consumers against foodborne parasites and ensuring fair practices in food trade. The guidelines also provide information that will be of value to consumers and other interested parties.

3. SCOPE

These guidelines for the control of foodborne parasites are applicable to all foods especially those foods identified in the FAO/WHO report, from primary production through consumption. They should complement guidelines in place for any other pathogens (e.g. bacteria and viruses).

Control measures should be applied to parasite hazards in proportion to the public health risk. Countries in which specific parasites are endemic should take special measures to reduce the identified risk.

Section 3 is subdivided into four food categories: i) Meat and meat products, ii) Milk and milk products, iii) Fish and fishery products, iv) Fresh fruits and vegetables. The Scope of these categories is the same as provided in the following codes:

- Meat and Meat products: [Code of Hygienic Practice for Meat \(CXC 58-2005\)](#), especially raw or undercooked meat.
- Milk and Milk products: [Code of Hygienic Practice for Milk and Milk Products \(CXC 57-2004\)](#), especially, unpasteurized milk and milk products.
- Fish and Fishery products: [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#), especially, raw or undercooked fish and fishery products.
- Fresh Fruits and Vegetables: [Code of Hygienic Practice for Fresh Fruits and Vegetables \(CXC 53-2003\)](#), especially fruits and vegetables consumed raw or undercooked.

The remaining sections contain guidelines applicable to the food chain after primary production (i.e. processing, food service, home preparation, and consumption), but are not subdivided into food categories.

4. USE

These guidelines follow the format of the [General Principles of Food Hygiene \(CXC 1-1969\)](#) and should be used in conjunction with it and other relevant codes of practice such as:

- [Code of Hygienic Practice for Meat \(CXC 58-2005\)](#).
- [Code of Hygienic Practice for Milk and Milk Products \(CXC 57-2004\)](#).
- [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#).
- [Code of Hygienic Practice for Fresh Fruits and Vegetables \(CXC 53-2003\)](#).

The World Organization for Animal Health (WOAH) develops standards for the prevention, detection and control of some foodborne parasites at the primary production stage. Therefore, these guidelines should also be used in conjunction with relevant Articles of the WOAH Codes and Manuals and the WOAH/FAO guide to Good Farming Practices for Animal Production Food Safety.

4.1 Roles of competent Authorities, food business operators and consumers

Flexibility in application of the Guidelines is important. They are primarily intended for use by government risk managers and industry in the design and implementation of food control systems.

Refer to Section 4.1 of the *General Principles of Food Hygiene* (CXC 1-1969).

5. GENERAL PRINCIPLES

Refer to Section 5 of the *General Principles of Food Hygiene* (CXC 1-1969).

6. DEFINITIONS

For the purpose of these Guidelines, the following definitions apply:

Definitions of the General Principles of Food Hygiene (CXC 1-1969) in addition to the definitions relevant to these guidelines:

[Fish²⁸

Aquaculture⁴

Feed²⁹

Fish farm^{4]}

[The definitions of **Fish**, **Aquaculture** and **Fish Farm** in the *Code of Practice for Fish and Fishery Products* (CXC 52-2003), and of **Feed** in the *Code of Practice on Good Animal Feeding* (CXC 54-2004), apply.]

Cyst – A transmission stage of a parasite that can cause infection when consumed. Environmental cysts are resistant to outside conditions and can be transferred with soil, dust, and water to food. Tissue cysts are located within animal tissues.

Foodborne Parasite – Any parasite that can be transmitted to humans by ingesting food.

Host – An organism which harbours the parasite.

Larvae – Immature form of helminths, before the development of the mature stage. Larvae can be infective or not.

Oocyst – The environmental, developmental stage of coccidian parasites, produced through sexual reproduction in the definitive host. Oocysts can be infective or not when produced or shed.

GOOD HYGIENE PRACTICES

7. INTRODUCTION AND CONTROL OF FOOD HAZARDS

Refer to Section 7 of the *General Principles of Food Hygiene* (CXC 1-1969).

8. PRIMARY PRODUCTION

Refer to Section 8 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

It is necessary to conduct a hazard analysis to identify the foodborne parasite hazards that could be present in the feed and food production environment and that may contaminate foods during primary production. Control of parasites during primary production is particularly important when subsequent control steps during processing may not be adequate to eliminate the hazard or reduce it to an acceptable level.

Sources of parasitic contamination of food and food producing animals at the primary production site include feed, water, soil, workers, untreated manure, sludge or fertilizers contaminated by faeces of human and/or domestic and wild animals, or proximity to other activities which could result in run-off or flooding with contaminated water. Therefore, attention to water quality throughout the food-chain, from primary production through processing to consumption is very important. In addition to the above, food-producing animals feeding on other live and dead animals (e.g. mammals, fish, birds, invertebrates), are important sources of parasitic infections.

Farm workers in endemic areas may be infected with parasites without feeling ill or showing any symptoms. In order to minimize the probability for contamination of the production environment with parasitic stages from human faeces, on-farm sanitary facilities should be installed and used, e.g. functional latrines in the field that do not leak contaminants into the primary production area, and an adequate means of hygienically washing

²⁸ [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#)

²⁹ [Code of Practice on Good Animal Feeding \(CXC 54-2004\)](#)

(e.g. scrubbing under running water) and drying hands. Waste from sanitary facilities should be hygienically disposed of in such a way as to eliminate contact of potentially infectious faeces with animals or pasture land.

[8.1]/[A] Meat and Meat Products

Important meat-transmitted foodborne parasites include, but are not limited to, *Taenia solium* (pigs), *Toxoplasma gondii* (pigs, cattle, chickens, sheep, goats, horses, game), *Trichinella spiralis* (pigs, horses, game) and other *Trichinella* spp. (pigs, horses and game), *Taenia saginata* (cattle), *Sarcocystis* spp. (pigs, cattle) and *Spirometra* spp. (fish, reptiles, and amphibians). Certain foodborne parasites present in domestic animals may be transmitted to food of plant origin via faecal contamination (e.g. *Echinococcus* spp., *Cryptosporidium* spp., *Fasciola* spp. and *Giardia duodenalis*.) These parasites are not associated with human illness from consumption of meat, however they should be controlled in animal production in order to interrupt their life cycle. For information on specific food vehicles for these parasites, see Table 2 in FAO/WHO report on *Multicriteria-Based Ranking for Risk Management of Food-Borne Parasites*²⁶.

[8.1.1]/[A.1] Environmental control

Refer to Section 8.1 of the [General Principles of Food Hygiene \(CXC 1-1969\)](#) and Section 5.5 of the [Code of Hygienic Practice for Meat \(CXC 58-2005\)](#) and the relevant Chapters of the WOA *Terrestrial Animal Health Code*³⁰. In addition:

Faeces of domestic and wild animals (e.g. *Toxoplasma* oocysts in felids), as well as human faeces (e.g. *Taenia* eggs), may contain parasites that are infective to domestic food-producing animals. Some parasites may also be transmitted to domestic animals or other animal hosts when these animals eat infected tissues from other animals. Where parasites will not be controlled at a later processing stage, the feasibility of controlling environmental introduction of foodborne parasites during primary production with available methods should be determined before primary production begins. The risk associated with the introduction of organic material (e.g. faecal and other material that may contain oocysts or eggs) from non-food-producing animals into the production environment should also be assessed.

Game meat may contain parasites that infect humans directly or via the infection of livestock. The environment of wild animals and open range domesticated animals cannot be controlled, therefore, mitigation measures should be in place to minimize the risk at a later stage in the food chain.

[8.1.2]/[A.2] Hygienic production

For information related to the control of parasites related to animal feed, refer to the [Code of Practice on Good Animal Feeding \(CXC 54-2004\)](#), Sections 4, 5 and 6.5 of the [Code of Hygienic Practice for Meat \(CXC 58-2005\)](#), and the relevant Chapters of the WOA *Terrestrial Animal Health Code*, and the WHO/FAO/OIE Guidelines for the surveillance, prevention and control of taeniosis/cysticercosis³¹, and FAO/WHO/OIE Guidelines for the surveillance, management, prevention and control of trichinellosis³².

Where indicated by a hazard analysis, control measures and/or hygienic practices should be implemented that prevent foodborne parasites from contaminating foods or infecting food animals during primary production, or that reduce contamination to an acceptable level.

Fully enclosed animal housing systems, or other systems that prevent intrusions of potentially contaminated small animals or unauthorized people, combined with other good production practices, can be effective in controlling foodborne parasite hazards in meat, since such systems have been demonstrated to be effective for a number of parasites (e.g. *Trichinella* spp., *Toxoplasma*).

Feed should be effectively protected against rodents (e.g. *Trichinella* spp. control), cats (e.g. *Toxoplasma gondii* control) and other animals. All dead animals should be immediately removed from feed storage and food-producing animal production areas and disposed of in a safe manner.

³⁰ Refer to the WOA website: <http://www.oie.int/en/international-standard-setting/terrestrial-code/access-online/>

³¹ <http://www.oie.int/doc/ged/d11245.pdf>

³² http://www.trichinellosis.org/uploads/FAO-WHO-OIE_Guidelines.pdf

Primary producers should supply water that is not a significant source of transmission of foodborne parasites to food-producing animals and to the extent possible block access of food producing animals to surface water and untreated water collection systems to minimize the potential for infection with parasites.

In order to assess whether foodborne parasite controls at primary production are properly implemented and effective, control measures should be documented and verified. Animal surveillance may be a useful tool for assessing control measure needs/shortcomings; however, because of the practical limitations of sampling and testing methodology, testing cannot assure the absence of a parasite hazard.

[8.1.3]/[A.3] Handling, storage and transport

Refer to Section 8.3 of the *General Principles of Food Hygiene* (CXC 1-1969).

[8.1.4]/[A.4] Cleaning, maintenance and personnel hygiene

Refer to Section 8.4 of the *General Principles of Food Hygiene* (CXC 1-1969) and the relevant Chapters of the *WOAH Terrestrial Animal Health Code* for recommendations on cleaning, disinfection and personal hygiene.

[8.1.5]/[A.5] Monitoring and surveillance at primary production

Refer to the relevant Chapters of the *WOAH Terrestrial Animal Health Code*. Surveillance and monitoring of foodborne parasites in food animals and in species that are potential sources of parasites could be effective in developing risk management strategies. Monitoring and surveillance can be useful as tools to verify the effectiveness of parasite controls, and should begin at primary production.

Assurance that a parasite hazard is adequately controlled can be attained through demonstration of properly implemented controls and hygienic practices, which may be supported by a series of negative test results over a sufficient time period through a risk-based surveillance programme.

It is important to exchange information between the owner of the herds and the slaughterhouse or processing plant e.g.:

- When the status of the herd in relation to parasite infection (e.g. history of parasitic infection) is known, it should be communicated to the slaughterhouse in order to facilitate a more targeted monitoring of parasites in the slaughterhouse.
- The status of the meat, following a post-mortem inspection in the slaughterhouse, should be provided to the owner of herds, to facilitate a more targeted control at primary production.

[8.2]/[B] Milk and milk products

Consumption of unpasteurized milk has been associated with outbreaks of cryptosporidiosis and toxoplasmosis. Contamination of unpasteurized milk with *Cryptosporidium* spp. may result from unsanitary milking conditions, such as when the udders are not properly cleaned. Outbreaks of toxoplasmosis have been associated with the consumption of unpasteurized goat and camel milk. Infective stages of *Toxoplasma* in recently infected animals may be excreted in the milk and might result in milk-borne infection. For information on specific food vehicles for these parasites, see Table 2 in FAO/WHO report on *Multicriteria-Based Ranking for Risk Management of Food-Borne Parasites*²⁶.

[8.2.1]/[B.1] Environmental control

Refer to Section 3.1 of the [Code of Hygienic Practice for Milk and Milk Products \(CXC 57-2004\)](#).

Cats should be excluded, to the extent possible, from barns and food production, handling and storage areas used for dairy herds (e.g. cows, goats, sheep and camels).

[8.2.2]/[B.2] Hygienic production

Refer to the [Code of Practice on Good Animal Feeding \(CXC 54-2004\)](#) and Section 3.2 of the *Code of Hygienic Practice for Milk and Milk Products* (CXC 57-2004).

[8.2.3]/[B.3] Handling, storage and transport

Refer to Section 3.3 of the *Code of Hygienic Practice for Milk and Milk Products* (CXC 57-2004).

[8.2.4]/[B.4] Cleaning, maintenance and personnel hygiene

Refer to Section 6 of the *Code of Hygienic Practice for Milk and Milk Products* (CXC 57-2004).

[8.3]/[C] Fish and fishery products

Important fish-transmitted foodborne parasites include Opisthorchiidae in freshwater fish, *Paragonimus* spp. in freshwater crustaceans, Anisakidae in marine fish, crustaceans and cephalopods, Heterophyidae in freshwater/brackish water fish, and Diphyllbothriidae in freshwater and marine fish. For information on specific food vehicles for these parasites, see Table 2 in *Multicriteria-Based Ranking for Risk Management of Food-Borne Parasites*, Report of a Joint FAO/WHO Expert Meeting, 2012²⁶.

[8.3.1]/[C.1] Environmental control

Refer to Sections 6.1.1 and 6.1.2 of the [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#).

Wild fish, and aquacultured fish without controlled rearing conditions, may contain parasites that infect people. The environment of wild fish cannot be controlled, requiring measures to be taken at a later stage of the food chain, e.g. processing, for fish that will be consumed raw or undercooked.

The source of water used for aquaculture fish farming can be a risk factor for parasitic infections. The larval stages of certain trematodes, which may be present in fish farm water, can penetrate fish skin and infect fish tissues. Aquaculture primary producers should use clean water and seek appropriate guidance on water quality, and should prevent influx of contaminated water (including waste water). The hygienic suitability of the water, under both normal and rain-storm conditions, should be assessed.

Where feasible, material derived from on-board evisceration of fish showing signs of infection by parasites communicable to humans should not be disposed of at sea unless it has undergone a treatment that kills the parasites, in order not to maintain the parasite life cycle.

Some aquaculture methods may reduce a parasite hazard to an acceptable level, for example, ocean pen-reared salmon that are raised on commercial pelleted feed have not been observed to contain any anisakid worms compared to wild salmon. Closed systems with controlled feed and environment conditions can effectively eliminate parasites that normally occur in wild fish.

[8.3.2]/[C.2] Hygienic production

Refer to Section 3 and Section 6 of the [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#), and the [Code of Practice on Good Animal Feeding \(CXC 54-2004\)](#) and the relevant Chapters of the *WOAH Aquatic Animal Health Code*³³ the *FAO Technical Paper on Assessment and Management of Fish Safety and Quality-Current Practices and Emerging Issues*³⁴.

To prevent potential transmissions of parasites, fingerlings should only be purchased from producers who implement reliable source management systems and Good Aquaculture Practice (GAqP). Fingerlings collected from the wild may contain foodborne parasites that remain a hazard in adult fish.

Animals and people infected with foodborne parasites may excrete parasite eggs that enter water and develop into larval stages that subsequently infect farmed fish. In order to minimize the opportunity for contamination of the production environment with parasitic stages from human faeces, on-farm sanitary facilities should be installed, e.g. functional latrines, and an adequate means of hygienically washing and drying hands.

Animals, including dogs and cats, are hosts for freshwater trematode fishborne parasites and should be excluded from land-based fish ponds to the extent possible. Good practices include not feeding raw meat/offal of fish to dogs and cats, preventing fish-eating mammals from accessing fish ponds and controlling the population of semi-domesticated or stray/feral dogs and cats in close vicinity of fish farms. Workers infected with or being treated for fish-borne trematodes (liver and intestinal flukes) should be excluded from the farm environment during treatment.

Attention should also be given to animals that serve as intermediate hosts³⁵ in the life cycle of fishborne parasites. For example, in the case of aquaculture, the exclusion of snails, as intermediate hosts for fishborne

³³ <http://www.oie.int/international-standard-setting/aquatic-code/access-online/>

³⁴ <http://www.fao.org/3/a-i3215e.pdf>

³⁵ A host which harbours the larval developmental stages of the parasite prior to maturity.

trematodes, from fish farm areas, may help interrupt trematode life cycles in fish ponds. For wild fish, intermediate hosts cannot be controlled, and fish migrate from different areas with varying risks for exposure to parasites.

Using raw fish as feed for aquaculture is likely to introduce a risk of parasitic infection, therefore it should be avoided as much as possible. Raw fish used for feed may be previously frozen in order to inactivate parasites. It is particularly important to inactivate parasites in feed where the fish will not be subsequently frozen, and may be consumed raw or undercooked.

Toilets should not directly empty into land-based fish ponds. Fishponds should be protected from contamination from human and animal faeces, pollution with sewage and other wastes. Untreated human and animal excreta should not be used as fertilizer or as fish food.

Where needed, control measures at primary production should be assessed in order to determine if they are properly implemented and effective. Fish surveillance may be a useful tool for assessing control measure needs/shortcomings; however, because of the practical limitations of sampling and testing methodology, testing cannot assure the absence of a parasite hazard.

[8.3.3]/[C.3] Handling, storage and transport

Eviscerating fish without any undue delay during harvest is helpful to prevent migration of Anisakidae larvae from the viscera into the flesh after harvest.

Refer to Sections 6.3.5 and 6.3.6 of the [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#), and the relevant Chapters of the *WOAH Aquatic Animal Health Code* for considerations for transport.

[8.3.4]/[C.4] Cleaning, maintenance and personnel hygiene

Refer to Sections 3.4 and 3.5 of the [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#) and the relevant Chapters of the *WOAH Aquatic Animal Health Code*.

[8.3.5]/[C.5] Monitoring and surveillance at primary production

Examining fish for live fishborne parasites may be a useful tool to assess the effectiveness of fishborne parasite preventive control measures. Data from monitoring and surveillance can be useful to develop and review risk management strategies.

Assurance that a parasite hazard is adequately controlled may be attained through demonstration of properly implemented controls and hygienic practices, which may be supported by a series of negative test results over a sufficient time period through a risk-based surveillance programme.

[8.4]/[D] Fresh fruits and vegetables

Important fruit- and vegetable-transmitted foodborne parasites include, but are not limited to, *Taenia solium*, *Echinococcus granulosus*, *Echinococcus multilocularis*, *Toxoplasma gondii*, *Entamoeba histolytica*, *Cryptosporidium* spp., *Ascaris* spp., *Giardia duodenalis*, *Fasciola* spp., *Cyclospora cayetanensis*, *Trichuris trichiura*, *Balantidium coli*, and *Toxocara* spp. For information on specific food vehicles for these parasites see Table 2 in FAO/WHO report on *Multicriteria-Based Ranking for Risk Management of Food-Borne Parasites*²⁶.

Certain fruits and vegetables are consumed raw without a cooking or freezing step or disinfection to kill parasites. In this case, controls that reduce the parasite hazard to an acceptable level during primary production are especially important.

[8.4.1]/[D.1] Environmental control

Refer to Section 3.1 of the [Code of Hygienic Practice for Fresh Fruits and Vegetables \(CXC 53-2003\)](#).

Areas for cultivation of fresh fruits and vegetables need to be assessed in terms of their susceptibility to direct or indirect faecal contamination from wild animals, domestic animals and/or humans, whether from run-off, flooding, irrigation water, or natural fertilizers. Prior to selecting the site for cultivation it should be determined if adequate control measures can be implemented to manage any identified risks.

[8.4.2]/[D.2] Hygienic production

Refer to the [Code of Hygienic Practice for Fresh Fruits and Vegetables \(CXC 53-2003\)](#) and the *WHO/WOAH Manual on Echinococcus in Human and Animals*³⁶.

The use of biological soil amendments of animal origin, particularly on fresh produce, should be managed to minimize the potential for contamination with parasites (e.g. adequately treating manure). Parasite eggs and oocysts can survive for years in the environment, and can be highly resistant to environmental changes; for example *Ascaris* eggs can remain viable in anaerobically digested sewage sludge.

In case the presence of infected snail intermediate host (Lymnaeidae) is identified, aquatic plants, such as watercress, grown in the area should not be harvested for raw consumption in order to prevent infection with *Fasciola hepatica* and *F. gigantica*.

Flooding may cause contamination of crops with water containing the parasite eggs, cysts and oocysts from animal or human faeces. After such events, produce should be evaluated for risk of contamination and where there is a risk, proper disposal of the affected produce is needed.

[8.4.3]/[D.3] Handling, storage and transport

Refer to Section 8.3 of the *General Principles of Food Hygiene* (CXC 1-1969).

[8.4.4]/[D.4] Cleaning, maintenance and personnel hygiene at primary production

Refer to Sections 3.2.3 and 3.4 of the [Code of Hygienic Practice for Fresh Fruits and Vegetables \(CXC 53-2003\)](#).

9. ESTABLISHMENT – DESIGN OF FACILITIES AND EQUIPMENT

9.1 Location and structure

9.1.1 Location of establishment

Refer to Section 9.1.1 of the *General Principles of Food Hygiene* (CXC 1-1969).

9.1.2 Design and layout of food establishment

Refer to Section 9.1.2 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

The post-harvest processing establishment should be designed to exclude animals that may excrete faeces that contain parasite stages. The layout should minimize the introduction of soil that may contain faeces from animals and parasite stages from the outside environment (e.g. changing boots/clothes at the entrance of the establishment).

9.1.3 Internal structures and fittings

Refer to Section 9.1.3 of the *General Principles of Food Hygiene* (CXC 1-1969)

9.1.4 Temporary/Mobile food establishments and vending machines

Refer to Section 9.1.4 of the *General Principles of Food Hygiene* (CXC 1-1969)

9.2 Facilities

Refer to Section 9.2 of the *General Principles of Food Hygiene* (CXC 1-1969)

9.3 Equipment

Refer to Section 9.3 of the *General Principles of Food Hygiene* (CXC 1-1969)

10. TRAINING AND COMPETENCE

10.1 Awareness and responsibilities

Refer to Section 10.1 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

Workers engaged in primary production, processing, preparation, retail or food service should be trained and/or instructed in the control of foodborne parasites (e.g. from good animal husbandry practices to hygiene and sanitation measures) to a level appropriate to the operations they are to perform. Particular attention should

³⁶ WHO/OIE Manual on echinococcosis in humans and animals A public health problem of global concern.

be paid to abattoir workers who may be performing post-mortem inspection procedures and food handlers of ready-to-eat foods.

10.2 Training programmes

Refer to Section 10.2 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

Training programmes should contain information on the following, as appropriate to those being trained:

- The potential for food to be a vehicle of transmission of foodborne parasites if contaminated.
- The potential sources and routes of transmission of foodborne parasites.
- The potential for persistence of parasites in/on contaminated foods and food production settings.
- The need to comply with good animal husbandry practices and the importance of compliance with such practices, including:
 - the role of domestic and wild animals in the transmission of certain parasites;
 - the importance of on-farm sanitation and hygiene in interrupting the life cycle of parasites and minimizing the opportunity for faecal-oral transmission; and
 - the importance of animal feed management to avoid domestic and wild life parasite contamination.
- Proper hand washing practices and the importance of strict compliance with hand washing instructions at all times, particularly after being in contact with faecal matter. It is advisable to educate each new employee in the proper practices that are to be followed for hand-washing.
- The importance of adequate food processing and preparation to eliminate potential parasite risks.
- Task-specific practices to reduce or eliminate the risks of parasites in foods.

10.3 Instruction and supervision

Refer to Section 10.3 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

Training and instructions should be given to all new personnel on the transmission and management of foodborne parasites.

Inspectors or other relevant authorities, who inspect fields, post-harvest processing plants, and food service facilities, should also be trained.

10.4 [Instruction and supervision]/[Refresher training]

Refer to Section 10.4 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition:

Periodic retraining of existing personnel should be given as refresher and to maintain competence level of all personnel.

11. ESTABLISHMENT MAINTENANCE, CLEANING AND DISINFECTION, AND PEST CONTROL

Refer to Section 11 of the *General Principles of Food Hygiene* (CXC 1-1969) in addition [to the following in section 11.2.1]:

Insects, such as flies and cockroaches, and animals such as rodents and birds can transport parasite stages from faeces to food and should be controlled.

12. PERSONAL HYGIENE

Refer to Section 12 of the *General Principles of Food Hygiene* (CXC 1-1969), in addition:

Proper personal hygiene such as hand-washing practices should be used to prevent faecal-oral transmission of parasites. For example, workers infected with the tapeworm *T. solium* with improper hand-washing practices can spread eggs that result in the severe disease neurocysticercosis.

13. CONTROL OF OPERATION/CONTROL OF FOOD HAZARDS

Control measures are used to address specific foodborne parasite hazards, e.g. as part of a Hazard Analysis and Critical Control Point (HACCP)-based system. Contamination of foods during processing with parasites transmitted by the faecal-oral route is typically controlled by a stringent application of hygiene control systems, which could be referred to as, e.g. Good Hygienic Practices (GHPs) and sanitation standard operation procedures (SSOPs). These prerequisite programs, together with validated interventions for specific parasites provide a framework for the control of foodborne parasites.

During the parasite hazard analysis, food business operators should consider how the product will be further processed, prepared and consumed in order to determine appropriate parasite controls. Where the hazard analysis indicates the presence of a significant foodborne parasite hazard, slaughter and post-harvest processing operations should have control measures in place that prevent or eliminate the hazard or reduce it to an acceptable level.

The hazard analysis may determine that a foodborne parasite hazard is adequately controlled at primary production, or by the previous processor. In this case, methods may be used to verify that previous control measures are adequate, such as inspecting the implementation of control measures at the primary producer or previous processor, and for some products, testing incoming product for the presence of parasites.

Various processes have been shown to control parasites in selected food items, but the conditions needed to inactivate parasites are subject to substantial variability depending on the parasites, the food matrix and the location of parasites in the food matrix. Specific processing steps and processing combinations should be subject to rigorous validation to ensure consumer protection. For additional information on validation, refer to the [Guidelines for the Validation of Food Safety Control Measures \(CXG 69-2008\)](#). Control measures may include: freezing, heat treatment, salting, drying, high pressure processing, filtration, sedimentation, UV light, ozone and irradiation. Specific processing steps and processing combinations (hurdle concept) to control parasites should be used in accordance with guidance from competent authorities, where available.

13.1 Description of products and processes

Refer to Section 13.1 of the *General Principles of Food Hygiene* (CXC 1-1969).

13.2 Key aspects of hygiene control systems

13.2.1 Time and temperature control

Time and temperature control treatments (freezing and heating) that will result in the reduction/elimination of viable parasites are the most commonly used preventative control measures. Such treatments should be done in accordance with validated parameters, as described in relevant and reliable guidelines and other scientific literature.

13.2.2 Specific process steps

13.2.2.1 Freezing

Many parasites in food are susceptible to freezing. However, specific time/temperature combinations are required to inactivate parasites by freezing, and these are also dependent on the food type and portion size. Some parasites (e.g. *Trichinella nativa* and *T. britovi* larvae or eggs of *Echinococcus multilocularis*) are resistant to freezing.

For control of parasites in fish and fishery products intended for raw consumption by freezing, refer to Annex 1 of the [Code of Practice for Fish and Fishery Products \(CXC 52-2003\)](#). For control of parasites in cold smoked fish, smoke-flavoured fish, and smoke-dried fish refer to Annex 1 of the [Standard for Smoked Fish, Smoke-flavoured Fish and Smoke-dried Fish \(CXS 311-2013\)](#).

13.2.2.2 Heat treatment

Parasites can be inactivated by adequate heat treatment of foods and water. Other validated treatments may be used.

13.2.2.3 Salting, curing, marinating, pickling, smoking

Processing methods such as salting, curing, marinating, pickling, smoking, and addition of food additives that may be effective for the control of certain other foodborne pathogens are generally not sufficient for the control

of foodborne parasites. Combinations of several treatments (hurdle concept) can be effective to control parasites. When a combination of treatments is used, it should be subject to rigorous validation to ensure consumer protection.

13.2.2.4 Irradiation

Irradiation is a possible measure for parasite control. Refer to the [General Standard for Irradiated Foods \(CXS 106-1983\)](#).

13.2.2.5 Washing

Fruits and vegetables should be washed with water in accordance with the Section 5.2.2.1 of the [Code of Hygienic Practice for Fresh Fruits and Vegetables \(CXC 53-2003\)](#) to reduce parasites. However, it should be noted that most parasite eggs or oocysts are sticky and difficult to remove from fruits and vegetables, particularly those with crevices or folds on the surface.

13.2.2.6 Packaging

It should be noted that vacuum packaging does not alter the infectivity of parasites in food.

13.3 Water

Refer to Section 13.3 of the *General Principles of Food Hygiene* (CXC 1-1969).

13.4 Documentation and records

Documentation related to validation, monitoring and verification activities regarding the control measures used for parasites should be kept.

Monitoring and review of foodborne parasite safety control systems is an essential component of application of a risk management framework (RMF). It contributes to verification of process control and demonstrating progress towards achievement of public health goals.

Information on the level of control of parasites at appropriate points in the food chain can be used for several purposes e.g. to validate and/or verify outcomes of food control measures, to monitor compliance with public health goals, and to help prioritise regulatory efforts to reduce foodborne parasite illnesses.

13.5 Recall Procedures – removal from the market of unsafe food

Refer to Section 13.5 of the *General Principles of Food Hygiene* (CXC 1-1969).

14. PRODUCT INFORMATION AND CONSUMER AWARENESS

14.1 Lot identification and traceability

Refer to section 14.1 of the *General Principles of Food Hygiene* (CXC 1-1969).

14.2 Product information

Labels may be used to help differentiate between products that are intended for raw consumption and products that are intended to be cooked by the consumer. However, even with the beneficial use of labels instructing consumers to cook the product, a parasite hazard should be reduced to an acceptable level before marketing products that are likely to be consumed raw or undercooked.

14.3 Product Labelling

Refer to section 14.3 of the *General Principles of Food Hygiene* (CXC 1-1969).

14.4 Consumer education

In order to increase consumer awareness of foodborne parasite hazards, education, is an important component of risk management, and in some cases may be the only practical option available. Consumers should recognize the risks associated with consumption of raw, undercooked, and lightly processed (e.g. marinated, smoked) meat and fish, as well as the consumption of certain fruits and vegetables that may not be rendered safe simply by washing alone. Consumer advice should be provided on how to prepare foods (e.g. cooking times and temperatures) and on the importance of good hygiene (e.g. hand-washing) in order to avoid infection with foodborne parasites. Consumers should always make sure to separate raw foods from cooked

food, and ready to eat fruit and vegetables to prevent cross-contamination while handling and preparing meals. The WHO *Five Keys to Safer Food* could assist in this process.³⁷

Education is particularly important for consumers in endemic areas, and in high risk groups, such as those who are pregnant or immunocompromised (e.g. *Toxoplasma gondii* in pregnant women and immunocompromised groups; *Cryptosporidium* spp. in children, immunocompromised groups and older adults.) For such consumers, advice on the preparation and consumption of high-risk foods such as fresh produce, adequate cooking of meat and fish prior to consumption and the importance of hygiene, e.g. hand- washing, is critical. When people are diagnosed with an *Anisakis* spp. nematodes allergy, they should be advised to avoid eating marine fish.

15. TRANSPORTATION

Refer to Section 15 of the *General Principles of Food Hygiene* (CXC 1-1969).

HAZARD ANALYSIS AND CRITICAL CONTROL POINT (HACCP) SYSTEM AND GUIDELINES FOR ITS APPLICATION

16. INTRODUCTION TO HACCP

Refer to Section 16 of the *General Principles of Food Hygiene* (CXC 1-1969).

17. PRINCIPLES OF THE HACCP SYSTEM

Refer to Section 17 of the *General Principles of Food Hygiene* (CXC 1-1969).

18. GENERAL GUIDELINES FOR THE APPLICATION OF THE HACCP SYSTEM

Refer to Section 18 of the *General Principles of Food Hygiene* (CXC 1-1969).

19. APPLICATION

Refer to Section 19 of the *General Principles of Food Hygiene* (CXC 1-1969).

³⁷ WHO. 2006. Five Keys to Safer Food Manual. Available at: <http://www.who.int/foodsafety/publications/5keysmanual/en/>

Appendix IV**Key Issues or Considerations in the EWG Discussion****Introduction**

This document has been prepared by the Chairs of the Electronic Working Group (EWG) to facilitate discussions on the alignment of selected CCFH documents (CXG 85, CXG86 and CXG 88) with the revised General Principles of Food Hygiene (CXG 1-1969, hereinafter GPFH).

In the course of the alignment work, the Chairs identified a number of structural and editorial issues that required clarification. To address these, the Chairs circulated a set of questions to the EWG, either because different approaches could reasonably be taken during alignment or because the issues related directly to the terms of reference of the EWG. Members were invited to provide written replies, indicating their views on the most appropriate way forward.

This document summarizes the replies received, highlighting areas of consensus as well as points where divergent views were expressed. For each question, the rationale for asking it is outlined, the opinions of members are summarized, and a proposal from the Chairs is set out to guide the next steps in finalizing the aligned texts.

Detailed Questions for Consideration**Question 1: Front Page Statement**

The alignment process raised the question of whether a front-page statement should be added to indicate that the Code has been aligned with the revised GPFH. This question was considered important to signal to users that the document reflects the most recent structural framework, and to distinguish it from earlier versions.

Members generally supported this addition, with some emphasizing its value for transparency. A view was also expressed that the statement should specify the year of alignment, in order to make the timing of the update clear.

The Chairs propose including the statement “Aligned with GPFH in 202x” on the front page, with the year updated upon adoption. This approach ensures that users can easily identify aligned texts and place them in their proper context.

Question 2: Table of Contents

The revised GPFH structure is more detailed than previous versions, and the documents aligned with it are longer and contain additional cross-references. The question of whether to insert a table of contents (hereinafter ToC) was raised to address the challenge of accessibility for users.

While there was general agreement on the usefulness of a ToC, members expressed opposing opinions:

- Several members supported the inclusion of a ToC to improve usability.
- Some members opposed it, noting that a ToC is not standard Codex practice.
- Concerns were raised that numbering must remain strictly sequential, and that non-sequential numbering would be confusing.

The Chairs propose that a ToC be included in the aligned texts. To address concerns, the numbering will be kept sequential and logical, so that the ToC enhances usability while maintaining consistency with Codex drafting practices.

Question 3: Abbreviation Updates

During the review, outdated abbreviations and cross-references were noted in the existing Codes of Practice. In order to harmonize the documents with current Codex usage, the question was raised whether to update these systematically.

Members agreed that abbreviations should be aligned with current Codex practice to ensure consistency and avoid confusion. A correction was suggested to clarify that “CXC RCP” should become “CXC,” not “CXP.”

The Chairs propose that all abbreviations be updated in line with Codex conventions, incorporating the correction noted. This ensures accuracy and clarity across the aligned texts.

Question 4: OIE/WOAH Terminology

The existing Codes still use the acronym “OIE” for the World Organisation for Animal Health, although the organization has officially adopted “WOAH.” Since alignment with current terminology is an important aspect of the update, the question was raised whether to reflect this change throughout.

Members were unanimous in supporting the update, recognizing that retaining the older acronym would be inconsistent with current international usage.

The Chairs propose that all references to “OIE” be replaced with “WOAH.” This keeps Codex texts consistent with international standards and avoids confusion among users.

Question 5: Updating Hyperlinks

Many hyperlinks in footnotes are outdated or inactive. Since hyperlinks provide important access to referenced documents, the question was raised whether these should be updated immediately as part of alignment, or handled in a separate process.

Members agreed on the importance of updating hyperlinks, but expressed divergent views on timing:

- Some members supported updating hyperlinks now, especially where they are critical to understanding the text.
- Others preferred to defer this task to a separate process to avoid delaying the alignment exercise.

The Chairs propose that critical hyperlinks be updated during this alignment, while less urgent updates may be deferred. This approach maintains the integrity of the texts while ensuring timely completion of the alignment.

Question 6: Handling Missing Sections

Because the GPFH 2024 includes sections not present in certain Codes of Practice, it was necessary to decide how to handle these “missing” sections. The main options were either to insert a reference to the relevant GPFH section or to mark them as “not applicable.”

In their comments, members strongly preferred inserting references to the GPFH. They considered that using “not applicable” might be misunderstood as meaning that the provisions did not apply at all. One view, however, suggested that omission of a reference could be appropriate if the section was clearly irrelevant.

The Chairs propose adopting the approach of inserting references to the GPFH, while allowing omission only on a case-by-case basis where a section is genuinely inapplicable. This approach avoids misinterpretation while retaining flexibility.

Question 7: Post-Mortem Inspection in CXG 85

Post-mortem inspection is a subject not directly covered in the GPFH structure but addressed in CXG 85. During alignment, the question arose as to how this material should be retained in the text.

Members agreed that the content must be preserved but expressed different opinions on its placement:

- Several members supported creating a new standalone subsection, considering this clearer and more visible.
- Other members preferred integrating the content into an existing subsection, arguing this would maintain coherence with the GPFH structure.

The Chairs propose retaining the post-mortem inspection provisions in full, while inviting the committee to determine the most suitable placement. This ensures the content remains intact while allowing flexibility in structural presentation.

Question 8: Section Numbering in CXG 85

Aligning CXG 85 with the GPFH required decisions about numbering, particularly whether product-specific content should begin at subsection 13.6 after GPFH 13.1–13.5, or follow another system. The question was raised because numbering affects both usability and coherence.

Strong differences emerged:

- Some members opposed non-sequential numbering, emphasizing that product-specific provisions should start at the beginning of the section.
- Others suggested compromise solutions to preserve a link to the GPFH structure while maintaining clarity.

The Chairs propose that non-sequential numbering should not be used. Instead, a coherent numbering structure that respects sequence and avoids confusion should be developed, while still showing the relationship to the GPFH where appropriate.

Question 9: Scope of References to GPFH

Another issue was how references to the GPFH should be made, whether at the level of whole sections or more detailed subsections. This question matters because product-specific Codes sometimes introduce text that corresponds to subsections rather than full sections.

Members offered varying views:

- Some preferred referencing entire sections only, to keep the texts simple and uniform.
- Others favored a hybrid approach, allowing subsection references where these would aid clarity, especially when product-specific content was added.

In addition, during the alignment process, some EWG members suggested that for any section where additional content from the original document is inserted into certain subsections, the corresponding subsection references from the GPFH should also be included. This should apply not only to the subsections containing additional content, but also to the other subsections within the same parent section, even if no additional content is inserted. This approach will help ensure consistency and prevent misnumbering of subsections.

The Chairs propose a flexible approach: section-level references should be the default, but subsection references may be used where this adds clarity. This balances consistency with precision. For the subsection references, these new added references are in square bracket, for the consideration of the committee.

Question 10: Definitions in CXG 88

The alignment of CXG 88 required consideration of how definitions should be treated. This question arose because some definitions are shared with other Codex texts, while others are specific, and alignment called for a uniform approach.

Most members supported a hybrid model in which definitions are included but their sources are explicitly cited. One member preferred a general reference only, noting that this would avoid duplication.

The Chairs propose adopting the hybrid approach, citing sources explicitly where definitions are drawn from other Codex texts. This ensures clarity, avoids duplication, and maintains consistency with Codex practice.

Question 11: Cross-Referencing Additional Codex Texts

Finally, the question was raised whether to add footnotes cross-referencing other relevant Codex standards. This issue emerged because alignment with the GPFH revealed areas where related standards could help users interpret provisions.

Members generally supported the idea, but opinions diverged on timing:

- Some favored including essential cross-references now to improve clarity.

- Others suggested deferring less critical references to a future revision, to avoid delaying the current exercise.

The Chairs propose including only essential cross-references at this stage, while deferring others. This ensures immediate usability without complicating the alignment process.

Other outstanding issues

It was noted by one EWG member that in the draft aligned CXG85 and CXG86 shared in the EWG, there were similar content included under different sections.

In CXG85, the original paragraph read:

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

There is one following paragraph mentioning training to the personals involved in production, which read:

“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.”

In CXG86, the contents read:

“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.”

And its following paragraphs explained the key points in risk communication to all stakeholders including consumers, which read:

“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.

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.

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

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.”

The EWG member further suggested to reconsider the placing of these contents in CXG85 and CXG86, to ensure the consistent approach among revised documents.

According to this suggestion, the paragraph “Best practice in the control of *T. saginata* in the meat of domestic cattle should be communicated to all stakeholders in cattle production” was temporarily moved under headings “risk communication”. And the committee is invited to consider this issue further.

Conclusion – Way Forward

For the way forward, it is proposed that for questions where the answers are straightforward or where there is broad agreement among EWG members, the EWG chairs have already incorporated the necessary changes in accordance with the agreed approach. For questions or issues where differing opinions exist among EWG members, or for other individual points raised, square brackets have been included in the revised text to highlight these items for further consideration by the Committee. This approach ensures both efficiency in addressing consensus areas and transparency in presenting issues requiring further discussion.

Appendix V**List of participants of the EWG**

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Appendix VI

Proposed Workplan for the Future Alignment of CCFH Texts with CXC 1-1969

CCFH56 - 2026 (5 stds)	CCFH57-2027 (5 stds)	CCFH58-2028 (5 stds)
CXC 53-2003 Code of Hygienic Practice for Fresh Fruits and Vegetables	CXC 39-1993 Code of Hygienic Practice for Precooked and Cooked Foods in Mass Catering	CXC 15-1976 Code of Hygienic Practice for Eggs and Egg Products
CXC 57-2004 Code of Hygienic Practice for Milk and Milk Products	CXC 40-1993 Code of Hygienic Practice for Aseptically Processed and Packaged Low-Acid Foods	CXC 19-1979 Code of Practice for Radiation Processing of Food
CXC 66-2008 Code of Hygienic Practice for Powdered Formulae for Infants and Young Children	CXC 46-1999 Code of Hygienic Practice for Refrigerated Packaged Foods with Extended Shelf Life	CXC 23-1979 Code of Hygienic Practice for Low and Acidified Low Acid Canned Foods
CXC 75-2015 Code of Hygienic Practice for Low-Moisture Foods	CXC 47-2001 Code of Hygienic Practice for the Transport of Food in Bulk and Semi-Packed Food	CXC 30-1983 Code of Hygienic Practice for the Processing of Frog Legs
CXG 87-2016 Guidelines for the Control of Nontyphoidal Salmonella spp. in Beef and Pork Meat	CXC 48-2001 Code of Hygienic Practice for Bottled/Packaged Drinking Waters (Other than Natural Mineral Waters)	CXC 33-1985 Code of Hygienic Practice for Collecting, Processing and Marketing of Natural Mineral Waters