

# codex alimentarius commission



FOOD AND AGRICULTURE  
ORGANIZATION  
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WORLD  
HEALTH  
ORGANIZATION



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**ALINORM 03/16A**

**JOINT FAO/WHO FOOD STANDARDS PROGRAMME**

**CODEX ALIMENTARIUS COMMISSION**

**Twenty-Sixth Session**

**Rome, Italy, 30 June - 5 July 2003**

**REPORT OF THE NINTH SESSION OF THE CODEX COMMITTEE ON  
MEAT AND POULTRY HYGIENE**

*Wellington, New Zealand, 17 - 23 February 2003*

**Note:** *This report includes Codex Circular Letter CL 2003/10-MPH*

**Y8807/E**



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**CL 2003/10-MPH**  
**February 2003**

**TO:** Codex Contact Points  
Interested International Organizations

**FROM:** Secretary, Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme  
FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy

**SUBJECT:** **Distribution of the Report of the Ninth Session of the Codex Committee on Meat and Poultry Hygiene (ALINORM 03/16A)**

The report of the Ninth Session of the Codex Committee on Meat and Poultry Hygiene (CCMPH) is attached. It will be considered by the 26<sup>th</sup> Session of the Codex Alimentarius Commission (Rome, 30 June - 5 July 2003)

**PART A: MATTERS FOR ADOPTION BY THE 26<sup>TH</sup> SESSION OF THE CODEX ALIMENTARIUS COMMISSION**

**Draft General Principles of Meat Hygiene, advanced to Step 8 of the Codex Procedure (ALINORM 03/16A, Appendix II).** See also paras. 6 through 17 of this report.

**Proposed Draft Code of Hygienic Practice for Meat, advanced to Step 5 of the Codex Procedure (ALINORM 03/16A, Appendix III).** See also paras. 18 through 77 of this report

Governments and interested international organizations are invited to comment on the above document and should do so in conformity with the Procedures for the Elaboration of Codex Standards and Related Texts (*Codex Alimentarius Procedural Manual*, Twelfth Edition, pages 20-21). Comments should be forwarded to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax +39 06 57054593; e-mail [codex@fao.org](mailto:codex@fao.org)), **not later than 1 May 2003.**

**PART B: REQUEST FOR COMMENTS/INFORMATION**

**Proposed Draft Annex on Risk-Based Post-Mortem Examination Procedures for Meat, at Step 3 of the Codex Procedure (ALINORM 03/16, Appendix IV).** See also paras. 78 through 91 of this report.

**Proposed Draft Annex on Microbiological Verification of Processed Control of Meat Hygiene, at Step 3 of the Codex Procedure (ALINORM 03/16, Appendix V).** See also paras. 92 through 103 of this report.

**Discussion Paper on Proposed Draft Hygienic Provisions for Processed Meat (CX/MPH 03/7).** See also paras. 104 through 106 of this report.

Governments and interested international organizations are invited to provide their comments on Appendix IV and V to this report and on CX/MPH 03/7. Comments should be forwarded to Ms. Cindy Newman, Codex Committee on Meat and Poultry Hygiene, New Zealand Food Safety Authority, P.O. Box 2835 Wellington, New Zealand Fax +64 4 463 2583 - E-mail: [cindy.newman@nzfsa.govt.nz](mailto:cindy.newman@nzfsa.govt.nz) with a copy to the Secretary, Codex Alimentarius Commission, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy (fax +39 06 57054593; e-mail [codex@fao.org](mailto:codex@fao.org)) for **not later than 30 June 2003.**

Y8807/E



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## SUMMARY AND CONCLUSIONS

The Ninth Session of the Codex Committee on Meat and Poultry Hygiene reached the following conclusions:

### **MATTERS FOR ADOPTION BY THE 26<sup>TH</sup> SESSION OF THE CODEX ALIMENTARIUS COMMISSION:**

The Committee recommended the following text for final adoption at Step 8

- Draft General Principles of Meat Hygiene (ALINORM 03/16A, paras. 6-17 and Appendix II)

The Committee recommended the following text for preliminary adoption at Step 5:

- Proposed draft Code of Hygienic for Meat (ALINORM 03/16A, paras. 18-77 and Appendix III)

### **MATTERS OF INTEREST TO THE COMMISSION:**

The Committee:

- agreed to circulate the proposed draft Annex on Risk-Based Post-Mortem Examination Procedures for Meat for comments at Step 3 with a comments deadline of 30 June 2002 and that a drafting group prepare a revised version of the proposed draft Annex on the basis of the attached text (Appendix IV), discussions and written comments at the current session and written comments to be submitted, for circulation, additional comments and further consideration at its next meeting (ALINORM 03/16A, paras. 78-91 and Appendix IV);
- agreed to circulate the proposed draft Annex on Microbiological Verification of Process Control of Meat Hygiene for comments at Step 3 with a comments deadline of 30 June 2002 and that a drafting group prepare a revised version of the proposed draft Annex on the basis of the attached text (Appendix V), discussions and written comments at the current session and written comments to be submitted, for circulation, additional comments and further consideration at its next meeting (ALINORM 03/16A, paras. 92- 103 and Appendix IV);
- decided to request comments on document CX/MPH 03/7 “Discussion Paper on Proposed Draft Hygiene Provisions for Processed Meat” as currently drafted, with a comments deadline of 30 June 2003 and that a drafting group prepare a revised version of the hygiene provisions for processed meat for circulation, additional comments and further consideration at its next meeting (ALINORM 03/16A, paras. 104-106).

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**LIST OF ABBREVIATIONS USED IN THIS REPORT**

ALOP	Appropriate Level of Health Protection
BSE	Bovine Spongiform Encefalopathy
CAC/RCP	Codex Alimentarius Commission / Recommended Code of Practice
CAC/GL	Codex Alimentarius Commission / Guidelines
CCFH	Codex Committee on Food Hygiene
CCMPH	Codex Committee on Meat and Poultry Hygiene
CCFICS	Codex Committee on Food Import and Export Inspection and Certification Systems
CL	Circular Letter
CRD	Conference Room Document
EC	European Community
FAO	Food and Agriculture Organization of the United Nations
FSO	Food Safety Objectives
GHP	Good Hygienic Practice
HACCP	Hazard Analysis and Critical Control Point
OIE	Office International des Epizooties / International Office of Epizootics
QA	Quality Assurance (systems)
SSOP	Sanitation Standard Operating Procedures
WHO	World Health Organization





## REPORT OF THE NINTH SESSION OF THE CODEX COMMITTEE ON MEAT AND POULTRY HYGIENE

### THE OPENING OF THE SESSION

1. The Hon Annette King, Minister for Food Safety, opened the Ninth Session of the Codex Committee on Meat and Poultry Hygiene, which was held from 17-21 February 2003 in Wellington, New Zealand, at the kind invitation of the Government of New Zealand. The Session was chaired by Dr Andrew McKenzie, Executive Director, New Zealand Food Safety Authority. The Session was attended by 106 participants from 34 Member countries and 7 international organizations. A complete list of participants is attached as Appendix I.

### ADOPTION OF THE AGENDA (Agenda Item 1)<sup>1</sup>

2. The Committee adopted the Provisional Agenda as proposed. The Committee agreed to discuss the definitions from Agenda Item 4 “Proposed Draft Code of Hygienic Practice for Fresh Meat” prior to considering Agenda Item 3 “Draft General Principles of Meat Hygiene”.

### MATTERS REFERRED BY THE CODEX ALIMENTARIUS COMMISSION AND OTHER CODEX COMMITTEES (Agenda Item 2)<sup>2</sup>

3. The Committee noted matters arising from the 50<sup>th</sup> Session of the Executive and other Codex Committees related to the draft Medium-Term Plan 2003-2007; Risk analysis policies of the Codex Alimentarius Commission; relevant decisions of the 50<sup>th</sup> Session of the Executive Committee on proposed draft standards and related texts at Step 5 and consideration of new work proposals; proposed draft Code of Practice for the Processing and Handling of Quick Frozen Foods; decision of the Codex Committee on General Principles on the proposal to amend the Name and Terms of Reference of the Codex Committee on Meat and Poultry Hygiene; activities of the *ad-hoc* Intergovernmental Codex Task Force on Animal Feeding; and the decision of the 11<sup>th</sup> Session of the Codex Committee on Food Import and Export Inspection and Certification Systems related to the proposed draft *Guidelines for the Utilization and Promotion of Quality Assurance Systems to Meet Requirements in Relation to Food* and the draft *Guidelines for the Judgement of Equivalence of Sanitary Measures Associated with Food Inspection and Certification Systems*.

4. The Committee also noted deliberations of the 35<sup>th</sup> Session of the Codex Committee on Food Hygiene (Orlando, Florida, USA, 27 January – 1 February 2003) related to the discussion papers on Risk Management Strategies for *Salmonella* spp in Poultry and on Risk Management Strategies for *Campylobacter* spp. in Poultry (Broiler chicken) and the proposed concepts and definitions for Food Safety Objectives (FSO) and Appropriate Level Of Protection (ALOP) of the proposed draft *Principles and Guidelines for the Conduct of Microbiological Risk Management*. The representative of WHO noted activities of the Joint FAO/WHO Meetings of Microbiological Risk Assessment (JEMRA).

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<sup>1</sup> CX/MPH 03/1

<sup>2</sup> CX/MPH 03/2, CX/MPH 03/2 - Add. 1 (Matters of Interest to the Committee Arising from the 35<sup>th</sup> Session of the Codex Committee on Food Hygiene) and CRD 9 (Information from the OIE).

5. The Representative of the OIE informed the Committee of the activities of the OIE Working Group on Food Safety, which had recognized the importance of strengthening formal and informal contacts with the Codex Alimentarius Commission and its subsidiary bodies. He highlighted the main recommendations of the Working Group and in particular a need for procedures for the development, adoption and publication of joint standards, for the mutual recognition of standards developed by the two organizations and for the establishment of linkages between standards dealing with related subject areas, particularly in the area of primary production, ante- and post-mortem inspection. He informed the Committee of the ongoing comparative review of Codex and OIE texts with a view to harmonization while avoiding duplication and filling gaps. The Committee agreed on close collaboration between the Codex Alimentarius Commission and the OIE, particularly on primary production and ante- and post- mortem examination, and requested the Secretariat to keep the Committee updated on the status of collaboration between the two organizations.

### **DRAFT GENERAL PRINCIPLES OF MEAT HYGIENE (Agenda Item 3)<sup>3</sup>**

6. The 8<sup>th</sup> Session of the CCMPH forwarded the proposed draft General Principles of Meat Hygiene to the 50<sup>th</sup> Session of the Executive Committee for preliminary adoption at Step 5. The Committee agreed that the italicized text accompanying each of the principles was useful for information purposes and therefore retained it for the time being. It was agreed that a final decision on the retention or deletion of the text would be taken at a future meeting.<sup>4</sup>

7. The 50<sup>th</sup> Session of the Executive Committee (June 2002) adopted the proposed draft General Principles of Meat Hygiene at Step 5.<sup>5</sup>

8. The 9<sup>th</sup> Session of the CCMPH discussed the draft General Principles of Meat Hygiene as presented, and agreed to the following changes:

#### **General Discussions**

9. The Committee deleted the italicized explanatory text accompanying each of the principles, as it was felt that the principles in and of themselves adequately explained their content.

#### **Principle 2**

10. The Committee clarified the Principle to indicate that it is the responsibility of the establishment operator to produce meat that is safe **and** suitable in accordance with regulatory meat hygiene requirements.

#### **Principle 4**

11. The Committee broadened the text to indicate that all principles of food safety risk analysis, which included risk management, should be incorporated wherever possible and appropriate in the design and implementation of food hygiene programmes. The footnote to this Principle was also amended to include a reference to the Report of the Joint FAO/WHO Consultation on Principles and Guidelines for Incorporating Microbiological Risk Assessment in the Development of Food Safety Standards, Guidelines and Related Texts (Kiel, Germany, 18-22 March 2002).

#### **Principle 5**

12. In view of ongoing work in the Codex Committee on Food Hygiene related to the elaboration of a definition for Food Safety Objectives (FSO), the Committee removed the square brackets from this Principle and updated the references in the related footnote to this section.

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<sup>3</sup> ALINORM 03/16, Appendix II and comments submitted in response to CL 2002/6-MPH and CL 2002/31-MPH from Canada, Germany, New Zealand, Switzerland, USA, EC, IACFO (CX/MPH 03/3), CI (CX/MPH 03/3-Add. 1), Egypt (CX/MPH 03/3-Add. 2), IACFO (CRD 5), Philippines (CRD 7) and Brazil (CRD 10).

<sup>4</sup> ALINORM 03/16, para. 27 and Appendix II.

<sup>5</sup> ALINORM 03/3A, para. 71 and Appendix II.

**Principle 8**

13. The 11<sup>th</sup> Session of the Codex Committee on Food Import and Export Inspection and Certification Systems (CCFICS) noted that quality assurance systems were intended for voluntary application only and therefore, decided to discontinue the consideration of proposed draft Guidelines for the Utilization and Promotion of Quality Assurance Systems to Meet Requirements in Relation to Food.<sup>6</sup>

14. In view of the above decision of the CCFICS, the Committee decided to delete Principle 8 in its entirety. The Committee renumbered the remaining Principles accordingly, and also reversed the order of the newly numbered Principles 8 and 9 in order to more logically place the role of the competent authority before the Principle concerning the range of activities performed by personnel.

**Principle 10**

15. The newly numbered Principle 10 was revised to read that communication with consumers and other interested parties should be considered **and undertaken** where appropriate.

**Principle 12**

16. The term “where available” was deleted in the newly numbered Principle 11.

**Status of the Draft General Principles of Meat Hygiene**

17. The Committee forwarded the draft General Principles of Meat Hygiene to the 26<sup>th</sup> Session of the Codex Alimentarius Commission for final adoption at Step 8, and with the understanding that the Principles would eventually be incorporated into the Code of Hygienic Practice for Meat when the latter text was finalized.

**PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR FRESH MEAT (Agenda Item 4)<sup>7</sup>**

18. The 8<sup>th</sup> Session of the CCMPH appended the proposed draft Code of Hygienic Practice for Fresh Meat to its report for comment at Step 3 and agreed that a drafting group led by New Zealand would prepare a revised version of the Code for circulation, additional comment and further consideration at its next Session. The Committee agreed that the proposed draft Code would be revised on the basis of its discussions, written comments submitted and the proposed draft General Principles on Meat Hygiene.<sup>8</sup> The drafting group met in New Zealand in September 2002.

19. The Committee discussed the proposed draft Code of Hygienic Practice for Fresh Meat as presented, and agreed to the following changes:

**General Comments**

20. The delegation of Denmark, speaking on behalf of the Member States of the European Community, stated that they reserved their position concerning the role of veterinary inspector and the definitions of ante- and post-mortem examination until the 10<sup>th</sup> CCMPH as the EC legislation concerning these issues was in the process of being revised and the outcomes of the process were not yet known.

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<sup>6</sup> ALINORM 03/30A, paras. 17-20.

<sup>7</sup> CX/MPH 03/4, and comments from Israel, Paraguay and Consumers International (CX/MPH 03/4, Add. 1), United States (CRD1), India (CRD 2), European Community (CRD 3), Indonesia (CRD 4), IACFO (CRD 5), Canada (CRD 6), Philippines (CRD 7) and Mexico (CRD 8).

<sup>8</sup> ALINORM 03/16, paras. 76-77 and Appendix III.

**Title**

21. The Title was amended to Code of Hygienic Practice for Meat in view of the decision to extend the scope of the Code to include hygiene provisions for processed and other types of meat. The Committee agreed to refer to “meat” only, and deleted the term “fresh”, throughout the Code.

**Section 3 – Definitions*****Ante-mortem examination***

22. Despite the opinion of some delegations that ante-mortem inspection should only be carried out by an official veterinarian, the Committee decided at this stage to leave the term and definition for Ante-mortem Examination as presented. In this regard, it was noted that the term examination encompassed activities that were much broader than inspection per se and would provide flexibility to governments in assigning personnel to carry out these functions and therefore, the Committee replaced the term “inspection” with the term “examination” throughout the text.

***Carcass***

23. In recognition that the term carcass could apply to the body of an animal after slaughter as well as after killing in the field, the Committee modified the definition to read “The body of an animal after dressing”.

***Competent Person***

24. The Committee agreed to modify the definition to indicate that a competent person was subject to the requirements specified by the competent authority.

***Dressing***

25. In recognition that the term dressing referred to the carcass as well as the separation of a carcass into various parts, the definition was modified to read as “The progressive separation of the body of an animal into a carcass and other edible and inedible parts”.

***Establishment***

26. The Committee clarified the definition to indicate that meat hygiene activities were “performed” in buildings or areas that were approved, registered and/or listed by the competent authority for such purposes.

***Food Safety Objective (FSO)***

27. In recognition of the importance of harmonizing this definition with that under elaboration by the Codex Committee on Food Hygiene, the Committee agreed to insert the current CCFH definition, without reference to the term “microbiological”, as a compromise solution. This decision was taken with the understanding that the definition might need to be further revised to reflect the specific needs of the CCMPH.

***Meat***

28. In view of the Committee’s earlier decision to eliminate all references to “fresh” when used in conjunction with the term “meat” throughout the Code, (see para. 21) the Committee agreed to delete the 2<sup>nd</sup> bullet of the definition as it only applied to fresh product. However, the footnote to the 2<sup>nd</sup> bullet was retained.

***Offal***

29. The Committee noted that the term offal was only used in one instance in the text and therefore, changed the term in this instance to “edible parts”. In view of this decision, the term and definition for offal was deleted from the list of definitions.

***Organoleptic Examination***

30. In recognition of the use of taste in performing organoleptic examinations, the Committee modified the definition to read “Using the senses of sight, touch, taste and smell for the identification of diseases and defects”.

***Performance Parameter***

31. In the interest of harmonization, the Committee revised the term to read as “Performance Criteria” and revised the definition by including the text under development by the Codex Committee on Food Hygiene. The square brackets were removed, and the term “parameter” was changed to read as “criteria” as a consequential change throughout the list of terms and definitions and the remainder of the text.

***Safe for Human Consumption***

32. The Committee agreed that the minimization of any hazard affecting the safety of the product for human consumption was the primary purpose of the definition and therefore, deleted the specific footnote reference to maximum residue limits. Furthermore, the criteria used to ensure safety for human consumption were also modified to state that they “meet risk-based performance and process criteria for specified hazards” (bullet 2) and “do not contain hazards at levels that are harmful to human health” (bullet 3).

***Suitable for Human Consumption***

33. The Committee modified the definition to clarify that suitable for human consumption means that meat “is processed under hygienic conditions”, “is appropriate to its intended use” and “meet outcome-based parameters for specified diseases and defects as established by the competent authority”.

**Section 5 – Primary Production**

34. The Committee agreed to move Principle (vi) on Quality Assurance (QA) systems (Section 5.1) to a new paragraph 13 bis so as to avoid possible confusion and/or the implication that QA systems, which were intended for voluntary application, were part of basic principles applying to primary production.

**Section 5.1 – Principles of Meat Hygiene Applying to Primary Production**

35. The Committee agreed that problems faced by many countries in applying HACCP at primary production were adequately recognized in Principle (iv) as it allowed for the application of HACCP principles “to the greatest extent possible”.

36. The Committee also deleted the last sentence in 5.1 (ii) related to HACCP-based process controls at the establishment, for clarity.

**Section 5.2 – Hygiene of Slaughter Animals**

37. In the first sentence of paragraph 16, the Committee added the term “risk-based” to meat hygiene programmes so as to be consistent with the risk-based approach of the Code.

38. In the 2<sup>nd</sup> bullet of paragraph 16, the Committee changed the last part of the sentence (after the words “slaughter animals and meat”) to read “in order to improve hygiene on the farm, where producer-led QA-programmes are applied, to be incorporated into these programmes to improve their effectiveness”.

39. The Committee agreed that the Code should refer to animal welfare issues only when related to the safety and suitability of meat and therefore, amended the last bullet of paragraph 19 to read that “Animal stress issues may exist or arise that are likely to have an adverse impact on the safety and suitability of meat”, for consistency with Section 5.6.1. Noting that animal welfare issues were addressed in OIE texts, the Committee agreed to add references in the Code to these texts as appropriate.

### **Section 5.3 – Hygiene of Killed Wild Game**

40. The Committee agreed to clarify the fourth bullet of paragraph 23 by adding at the end of the sentence “unless a hunter, who is a competent person, has carried out an examination and has not detected or suspected abnormalities”.

### **Section 5.4 – Hygiene of Feedingstuffs**

41. The Committee agreed to move the footnote to the section title to acknowledge the specific mandate of the *Ad-hoc* Intergovernmental Codex Task Force on Animal Feeding on matters related to animal feeding and recognised that the main aim of the section was to make a general statement stressing the importance of animal feeding to meat hygiene.

### **Section 5.5 – Hygiene of the Environment**

42. Although the Committee recognised that environmental provisions were normally outside of its jurisdiction, it noted the role of other Codex Committees and international organizations in the control of animal and plant pests. However, it agreed that the inclusion of these provisions into the Code might be necessary when there are implications for the safety and suitability of meat.

43. Therefore, the Committee agreed to move the second sentence of paragraph 29 into the first single-line box as a chapeau to the section to read that “The competent authority should design and administer monitoring and surveillance programmes appropriate to the circumstances, that address:”. In addition, it amended the first bullet to read as “Hazards arising from animals and plants that may compromise the production of meat that is safe and suitable for human consumption”. The delegation of India did not agree with this decision as it was felt that other Codex bodies and international organizations more adequately addressed such provisions.

### **Section 6 – Presentation of Animals for Slaughter**

44. The Committee acknowledged that provisions concerning the identification of animals differed when applied in primary production as compared to presentation at slaughter houses, as in the former case such provisions should be more flexible. It therefore agreed to add in paragraph 34 the term “and appropriately identified”.

#### **Section 6.1 – Principles of Meat Hygiene Applying to Animals Presented for Slaughter**

45. In principle (iii) the text in parenthesis was deleted, as the issue was already adequately addressed in other sections of the Code.

46. The Committee deleted the second part of principle (v) as the provision related to HACCP was already adequately covered in Section 9.

#### **Section 6.2 – Conditions of Lairage**

47. The example in the fifth bullet was deleted as it only provided a partial and incomplete example of conditions applicable to feed withdrawal prior to slaughter.

#### **Section 6.3 – Ante-Mortem Examination**

48. The introductory first sentence in the box after paragraph 41 was amended to include the terms “procedures or operations” as other aspects of ante-mortem examination controls.

49. As it was noted that procedures for cleaning animals may be affected by many factors, including climatological conditions, the fourth bullet of paragraph 45 was amended to read: “presentation of animals that are sufficiently clean” in order to provide flexibility.

### **Section 6.3.3 – Ante-Mortem Judgement Categories**

50. In paragraph 47:

- the second bullet was modified to read “passed for slaughter subject to a second ante-mortem examination, .....” to better clarify the ante-mortem judgement category;
- the sixth bullet was deleted as the reference to emergency slaughter for animal welfare reasons was not adequately defined;
- the example in the seventh bullet was deleted, as it only provided a partial and incomplete example of conditions applicable to emergency slaughter.

### **Section 6.4 – Information of Animal Presented for Slaughter**

51. The terms “science- and” were inserted in the first line of the single line box of paragraph 49 and in the first bullet “/or” was added before “QA programmes” to stress the voluntary application of QA systems.

### **Section 7.2 – Examination of Killed Wild Game Presented for Dressing**

52. Paragraph 54 was revised to read: “Identity of the body of the animal along with those parts required for post-mortem examination, should be maintained until final post-mortem judgement” for consistency with the definitions of carcass and dressing.

### **Section 8.2 – Design and Construction of Lairages**

53. Paragraph 60 was revised and the text moved as a new second bullet in the single-line box to read as “there are appropriate layout and facilities for cleaning and/or drying of animals”.

### **Section 8.4 – Design and Construction of Areas where Animals are Dressed or Meat May Otherwise be Present and Section 8.5 – Design and Construction of Equipment where Animals are Dressed or Meat May Otherwise be Present**

54. The titles of the Sections were amended to add “Bodies of” for consistency with the definition of carcass.

55. The following texts were deleted as unnecessarily prescriptive:

- the fourth bullet of paragraph 66;
- “physically separated from other rooms” in the second bullet of paragraph 67;
- “be used solely for this purpose and” in the first bullet of paragraph 72.

### **Section 8.6 – Water Supply**

56. A footnote to the title of the Section was added to refer to relevant provision of the Codex General Principles of Food Hygiene (CAC/RCP 1-1969, Rev, 3-1970, Amended 1999).

### **Section 8.7 – Temperature Control**

57. The Committee acknowledged that temperature controls were not only used for ensuring meat safety but also meat suitability and therefore, agreed that specific reference to temperature should not be added as the same result could be achieved with temperature/time combinations. Therefore the Committee amended the second bullet of paragraph 77, to read “Storage of meat at temperatures that achieve the safety and suitability requirements”.

### **Section 8.8 – Facilities and Equipment for Personal Hygiene**

58. In paragraph 80 “and equipment” was added after facilities for consistency with the title of the Section.

### **Section 9.1 – Principles of Meat Hygiene Applying to Process Control**

59. To specify that the competent authority controls ante- and post-mortem examination, the Committee added at the end of Principle (xi) “as approved by the competent authority”.

### **Section 9.2.2 – Microbiological Criteria**

60. The Committee moved paragraph 90 in Section 9.2.2 to Section 9.2.4 (Outcome-Based Parameters for Process Control) to be consistent with the development of other parts of Section 9.

### **Section 9.2.3 - HACCP**

61. While recognizing that HACCP principles might be utilised for aspects other than meat safety (such as suitability), the Committee substituted paragraph 91 with the following: “Microbiological testing for verification of HACCP systems, e.g. for verification of critical limits and statistical process control, is an important feature of HACCP”.

### **Section 9.2.4- Outcome-Based Parameters for Process Control**

62. Paragraph 92 was modified to better clarify the concept and for consistency with the other parts of the Code by adding at the beginning of the paragraph “In a risk-based meat hygiene system” and by changing “enhanced” to “strengthened”. The Committee agreed to use the term “requirements” in paragraph 98 and throughout the text to avoid the implication that terms such as standards, guidelines, recommendations, etc. were mandatory.

63. Paragraph 98 was revised to read “Performance criteria for outcomes of process control may be difficult to establish for some hazards of concern and the competent authority may need to implement specific procedures and tests to achieve expected levels of consumers protection, e.g., BSE”.

64. In recognizing equivalence as a tool in comparing outcome-based performance criteria, the Committee added a new paragraph 99 to indicate that the “The competent authority should recognize different risk-based meat hygiene activities within its competence, which have been demonstrated to meet at least the same risk-based meat hygiene outcomes”.

### **Section 9.2.5 – Regulatory Systems**

65. Paragraph 100 was modified to read as follows:

- the second sentence was modified to read “The competent authority should” to avoid possible confusion as to the role of the competent authority in process control;
- in (i) “product tracing, as appropriate” was added in the parenthesis and in (ii) the example was extended to include “those aspects of ante- and post-mortem activities specified by the competent authority” before “or official certification”, for completeness;
- the last bullet was modified to a more general statement that read “additional risk management measures as specified by the competent authority”.

66. In paragraph 101 “and testing for pathogen, indicator organisms, residues, etc.” was added at the end of the first sentence, to provide a context for laboratory sampling. For clarity “verify” was changed to “conduct” in the first sentence and “, the type of establishment, the operator, etc” was added at the end of the second sentence of paragraph 102. The third bullet of paragraph 103 was modified to “withdrawing official supervision, or accreditation of competent personnel” as more appropriate.



### **Section 9.2.6 – Quality Assurance (QA) Systems**

67. While recognizing the contribution of QA systems in improving the effectiveness and efficiency of meat hygiene, the Committee debated the appropriateness of including provisions on the voluntary use of such systems in the Code. It was also noted that the 11<sup>th</sup> Session of the CCFICS discontinued the elaboration of guidelines on the utilization and promotion of such systems as they were intended for voluntary application only.

68. It was therefore decided to replace the entire Section (paras.104-107) with the following new paragraph “Whenever there are verifiable QA systems in place in the industry, the competent authority should take them into account” and a footnote referring to Section 4 “Quality assurance” of the *Guidelines for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems* (CAC/GL 26/1997).

### **Section 9.2.7 – Equivalence**

69. The Committee agreed to delete this Section and moved relevant components into Section 9.2.4 “Outcome-Based Parameters to Process Control” (see paras. 62-64).

### **Section 9.4 – Hygiene Requirements for Slaughter and Dressing**

70. In recognising that it was not always possible to ensure that in emergency situations a competent person was available for undertaking ante- and post-mortem examination, the Committee strengthened paragraph 109 by adding “to ensure that the meat is safe and suitable for human consumption”.

71. In paragraph 113, the sentence in parenthesis was changed to “While full separation of carcasses is more difficult in the case of poultry and farmed game birds, such contact should be minimized”. In paragraph 117, “e.g. for animal health emergency slaughter” was added to clarify the sentence.

### **Section 9.5.2 – Implementation of Post-Mortem Examination**

72. In the second single-line box of paragraph 126:

- the third bullet was aligned with the text of paragraph 124;
- the sixth bullet was aligned with the others by deleting “by the competent person undertaking post-mortem examination”;
- the examples in the seventh bullet were deleted as not appropriate.

### **Section 9.7 – Hygiene Requirements for process Control after Post-Mortem Examination**

73. The second sentence of paragraph 133 was reworded to refer to minimizing microbial growth. Paragraph 1351 was modified to clarify that the use of official health marks could not guarantee that products comply and/or remain in compliance with requirements, but only that the products have been produced in accordance to regulatory requirements.

74. Last bullet of paragraph 142 was clarified to read that “water dripping from overhead facilities and condensation should be controlled to the extent practicable, to prevent contamination of meat contact surface and meat”.

### **Section 14.1 – Principles of Training in Meat Hygiene**

75. While recognising that training activities were also carried out by the industry, the Committee specified that the principles applied to “training specified or recognized by competent authority” and principle (iii) was consequentially deleted. A new principle (iii bis) was included regarding the documentation of training programmes delivery.

**Appendix I - Post Mortem Examination Procedures: Guidelines for Development of a Risk-Based System and Appendix II – Judgement of Edible Parts of Animals as Unsafe or Unsuitable for Human Consumption**

76. The Committee agreed to delete the entire Appendix I, including Tables 1 and 2, and Appendix II. Although earlier version of the Codex Committee on Meat and Poultry Hygiene contained extensive recommendations on post-mortem examination procedures, the Committee decided that providing examples of post-mortem examination procedures in a risk-based meat hygiene code was unnecessary.

**Status of the Proposed Draft Code of Hygienic Practice for Meat**

77. The Committee forwarded the proposed draft Code of Hygienic Practice for Meat (see Appendix III) to the 26<sup>th</sup> Session of the Codex Alimentarius Commission for preliminary adoption at Step 5. In the interest of information exchange, the Committee also agreed to inform the Codex Committee on Food Hygiene.

**PRINCIPLES AND GUIDELINES FOR ESTABLISHING RISK-BASED ANTE- AND POST-MORTEM INSPECTION SYSTEMS FOR PARTICULAR SLAUGHTER POPULATIONS, INCLUDING EXAMPLES (Agenda Item 5a)<sup>9</sup>**

78. The 8<sup>th</sup> Session of the CCMPH accepted the offer by New Zealand, with the assistance of the Codex Secretariat, to prepare a discussion paper for consideration at its current meeting on the possible addition of an Annex to the proposed draft Code of Practice for Fresh Meat on principles and guidelines for establishing risk-based ante- and post-mortem inspection systems for particular slaughter populations, including examples.<sup>10</sup> The 50<sup>th</sup> Session of the Executive Committee (June 2002) approved the proposal as new work at Step 1 of the Procedure.<sup>11</sup>

79. In presenting the discussion paper, the Codex Consultant noted that post-mortem meat inspection procedures were a set of highly technical food hygiene measures that were unique to the production of meat. Although it was noted that the principles and guidelines presented could be adapted to the evaluation of post-mortem inspection procedures for determining the suitability of meat, such methodology was not developed in the current document. The different approaches used by countries in developing risk-based post-mortem examination procedures as well as the difficulty in incorporating examples of such procedures was also highlighted.

80. In this regard, the Codex Secretariat noted that FAO was developing a Manual on Good Practices for the Meat Industry that was based in part on the proposed draft Codex Code of Hygienic Practice for Meat. It was stated that the Manual would provide a practical basis for the implementation of the new code and practical guidelines for primary production and the meat industry. It was noted that the Manual was based on a risk analysis approach, and that it would be of value to veterinarians and other interested parties in carrying out their responsibilities related to meat hygiene as well as serving as a training manual. The Committee agreed that the FAO Manual should be taken into account in the continued development of this specific Annex as well as the Annex being developed on principles and guidelines on systems for microbiological process control for meat, including establishment of performance parameters for outcomes of process control and implementation of national microbiological databases (see agenda item 5b).

81. The Committee discussed the proposed draft principles and guidelines as presented, and agreed to the following changes:

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<sup>9</sup> CX/MPH 03/5 and comments submitted from Egypt, EC (CX/MPH 03/5-Add. 1), USA (CRD 1), EC (CRD 3) and Indonesia (CRD 4).

<sup>10</sup> ALINORM 03/16, para. 78.

<sup>11</sup> ALINORM 03/3A, para. 84 and Appendix III.

### **General Comments**

82. The Committee reaffirmed that the document did not cover ante-mortem inspection procedures and therefore, deleted all references to ante-mortem inspection throughout the text. The Committee also agreed that the text should be revised on the basis of previous decisions taken in the elaboration of the proposed draft Code of Hygienic Practice for Meat, including deleting the term “fresh” and changing the terms “inspection” to “examination” and “process parameters” to “process criteria” throughout the text.

### **Title**

83. The Title of the Annex was revised to read as “Risk-Based Post-Mortem Examination Procedures for Meat”.

### **Section 2 – Objectives of Risk-Based Post-Mortem Examination Procedures for Meat**

84. The Committee noted that this Section dealt with the evaluation, as opposed to development, of post-mortem inspection procedures and therefore, the introductory paragraph 4 of this section was revised to read “A risk-based approach to post-mortem examination can achieve the following objectives:”

### **Section 3.3 – Performance and Process Criteria**

85. The Committee agreed that the term “performance attributes” in paragraph 8 needed to be defined.

### **Section 5 – Guidelines for the Development of Risk-Based Post-Mortem Examination Procedures**

86. In order to avoid confusion with other aspects of the risk assessment process, the Committee changed the title of Section 5.1 to read as “Identification of the Meat Hygiene Issues”. The term “empirical” was also removed from paragraph 9.

87. The Committee agreed that a link needed to be established to improve the logic and flow between sections 5.1 and 5.2. The Committee revised the second sentence of paragraph 10 to read that “The number of animals examined by the inspection procedures under evaluation should be sufficiently large so as to give an estimate of the true prevalence of gross abnormalities achieved by specific post-mortem examination procedures.”

88. It was suggested that the entire Section 5 needed to be restructured to reflect the need for estimates of the prevalence of gross abnormalities in paragraph 10, to be followed by paragraphs 11 and 13, Section 5.4 and finally paragraph 12. It was also noted that the use of the terms sensitivity and specificity needed to be examined and clarified in Section 5.4, and that alternative inspection procedures in paragraph 19 needed to be clarified and defined.

### **Tables 1 and 2 - Examples**

89. In view of the limited usefulness of examples that varied greatly from country to country, the Committee deleted Tables 1 and 2 in their entirety.

### **Status of the Proposed Draft Annex on Risk-Based Post-Mortem Examination Procedures for Meat**

90. The Committee decided to append the proposed draft Annex on Risk-Based Post-Mortem Examination Procedures for Meat to its report (see Appendix IV) for comment at Step 3, with a comment deadline of 30 June 2003 (see Circular Letter to this report). The Committee agreed that a drafting group<sup>12</sup> would prepare a revised version of the Annex for circulation, additional comment and further consideration at its next meeting, and with the understanding that the revised version would be circulated no later than 30 September 2003.

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<sup>12</sup> Under the direction of New Zealand, with the assistance of Australia, Canada, Denmark, Germany, Sweden, USA and OIE.

91. The Committee agreed that the Annex should be revised by the drafting group on the basis of the attached text (see Appendix IV), the above discussions and written comments submitted at the current meeting and written comments to be submitted by the comment deadline of 30 June 2003.

**PRINCIPLES AND GUIDELINES ON SYSTEMS FOR MICROBIOLOGICAL PROCESS CONTROL FOR MEAT, INCLUDING ESTABLISHMENT OF PERFORMANCE PARAMETERS FOR OUTCOMES OF PROCESS CONTROL AND IMPLEMENTATION OF NATIONAL MICROBIOLOGICAL DATABASES (Agenda Item 5b)<sup>13</sup>**

92. The 8<sup>th</sup> Session of the CCMPH accepted the offer by New Zealand, with the assistance of the Codex Secretariat, to prepare a discussion paper for consideration at its current meeting on the possible addition of an Annex to the proposed draft Code of Practice for Fresh Meat on principles and guidelines on systems for microbiological process control for meat, including establishment of performance parameters for outcomes of process control and implementation of national microbiological databases.<sup>14</sup> The 50<sup>th</sup> Session of the Executive Committee (June 2002) approved the proposal as new work at Step 1 of the Procedure.<sup>15</sup>

93. In presenting the discussion paper, the Codex Consultant noted that microbiological monitoring at specific points in the food chain was increasing in importance as a tool for ensuring a risk-based approach to food safety. It was noted that specification of food safety microbiological outcomes assures that appropriate levels of consumer protection are achieved, while providing maximum flexibility to industry in terms of the detailed process control systems that are employed.

94. The Committee discussed the proposed draft principles and guidelines as presented, and agreed to the following changes:

**General Comments**

95. The Committee agreed that the text should be revised on the basis of previous decisions taken in the elaboration of the proposed draft Code of Hygienic Practice for Meat, including deleting the term “fresh” and changing the terms “inspection” to “examination” and “process parameters” to “process criteria” throughout the text. It was also suggested that at least one paragraph should be added to the document on the microbiological sampling of production areas and equipment.

**Title**

96. As the document addressed verification as opposed to monitoring activities, the title was amended to read “Microbiological Verification of Process Control of Meat Hygiene”.

**Section 2 – Objectives of Microbiological Monitoring of Process Control for Meat**

97. In recognition that a HACCP-based approach need not be limited to a validated HACCP plan, the Committee changed the second sentence of paragraph 4 to read that “Once process control has been validated .....”. In addition, the first bullet in paragraph 5 was modified by deleting the phrase “by the competent authority” in recognition that microbiological monitoring might also be used as a tool by the establishment operator.

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<sup>13</sup> CX/MPH 03/6 and comments submitted by the EC (CX/MPH 03/6-Add. 1), USA (CRD 1) and the EC (CRD 3).

<sup>14</sup> ALINORM 03/16, para. 78.

<sup>15</sup> ALINORM 03/3A, para. 84 and Appendix III.

### **Section 3 – General Principles for Microbiological Monitoring of Meat**

98. It was suggested that this section should be redrafted into two separate but related sections, namely, on microbiological verification and performance criteria. It was also suggested that the term statistical process control needed to be defined, and that the statement “The stringency of microbiological performance criteria should be proportional to risk” should be added to point 3(ii).

### **Section 4 – Guidelines for the Implementation of Microbiological Monitoring for Process Control of Meat**

99. The Committee noted that certain terms used in this section should be reviewed and clarified, e.g., differences in the terms “guideline”, “regulatory guideline”, “regulatory standard” and “mandatory regulatory standard” and how these terms relate to the term “microbiological criteria”.

100. It was further suggested that paragraph 10 needed to be expanded with more explanatory text, and that paragraph 13 should be more reflective of pre-slaughter hazards as well as the sanitary conditions of the plant. The necessity of including paragraph 15 was questioned.

101. In paragraph 25, it was clarified that regulatory responses should be graded according to different microbiological outcomes as well as the public health impact of specific pathogens.

### **Status of the Proposed Draft Annex on Microbiological Verification of Process Control of Meat Hygiene**

102. The Committee decided to append the proposed draft Annex on Microbiological Verification of Process Control of Meat Hygiene to its report (see Appendix V) for comment at Step 3, with a comment deadline of 30 June 2003 (see Circular Letter to this report). The Committee agreed that a drafting group<sup>16</sup> would prepare a revised version of the Annex for circulation, additional comment and further consideration at its next meeting, and with the understanding that the revised version would be circulated no later than 30 September 2003.

103. The Committee agreed that the Annex should be revised by the drafting group on the basis of the attached text (see Appendix V), the above discussions and written comments submitted at the current meeting and written comments to be submitted by the comment deadline of 30 June 2003.

### **PROVISIONS RELATED TO PROCESSED MEAT (Agenda Item 5c)<sup>17</sup>**

104. The 8<sup>th</sup> Session of the CCMPH noted its previous agreement that the proposed draft Code of Hygienic Practice for Fresh Meat should take into account meat hygiene throughout the entire food chain, including hygiene provisions relate to processed meat products. The Committee therefore requested that a discussion paper be prepared by New Zealand, with the assistance of the Codex Secretariat, on hygiene provisions for processed meat for potential inclusion in the Code.<sup>18</sup> The 50<sup>th</sup> Session of the Executive Committee (June 2002) approved as new work the extension of the Scope of the proposed draft Code of Practice for Fresh Meat to include provisions for the hygiene of processed meat.<sup>19</sup>

105. In view of time constraints, the paper was not circulated for comments before the meeting and therefore, comment summary paper CX/MPH 03/7-Add. 1 was not prepared.

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<sup>16</sup> Under the direction of New Zealand, with the assistance of Australia, Canada, Denmark, Germany, Sweden, UK, USA, IACFO and OIE.

<sup>17</sup> CX/FH 03/7.

<sup>18</sup> ALINORM 03/16, paras. 85-86.

<sup>19</sup> ALINORM 03/3A, para. 85 and Appendix III.

106. The Committee decided to request comments on document CX/MPH 03/7 as currently drafted, with a comment deadline of 30 June 2003 (see Circular Letter to this report). The Committee agreed that a drafting group<sup>20</sup> would prepare a revised version of the hygiene provisions for processed meat for circulation, additional comment and further consideration at its next meeting, and with the understanding that the revised version would be circulated no later than 30 September 2003.

#### **OTHER BUSINESS AND FUTURE WORK (Agenda Item 6)**

##### **Matters of Interest Arising from the 35th Session of the Codex Committee on Food Hygiene (Orlando, Florida, 17-21 February 2003)**

107. The Committee noted matters arising from the 35<sup>th</sup> Session of the Codex Committee on Food Hygiene (CCFH)<sup>21</sup> related to their consideration of discussion papers on Risk Management Strategies for *Salmonella* spp in Poultry and on Risk Management Strategies for *Campylobacter* spp. in Poultry (Broiler chicken) and the proposed concepts and definitions for Food Safety Objectives (FSO) and Appropriate Level Of Protection (ALOP) in the proposed draft *Principles and Guidelines for the Conduct of Microbiological Risk Management*.

108. The Committee noted that CCFH discussions on the proposed concepts and definitions for Food Safety Objectives (FSO) and Appropriate Level of Protection (ALOP) in the context of their consideration of the proposed draft Principles and Guidelines for the Conduct of Microbiological Risk Management<sup>22</sup> had already been considered by the CCMPH when elaborating the proposed draft Code of Hygienic Practice for Meat (see agenda item 4).

109. In regard to the continued elaboration of discussion papers on Risk Management Strategies for *Salmonella* spp in Poultry<sup>23</sup> and on Risk Management Strategies for *Campylobacter* spp. in Poultry (Broiler chicken)<sup>24</sup> under the CCFH, the Committee accepted the offer of the Codex Secretariat to provide an update on these subjects at the next 10<sup>th</sup> Session of the CCMPH, especially as related to the future consideration of the proposed draft Code of Hygienic Practice for Meat. The Codex Secretariat agreed to facilitate communication between CCMPH and CCFH and vice-versa.

#### **DATE AND PLACE OF NEXT SESSION (Agenda Item 7)**

110. The Committee was informed that the tenth Session of the Codex Committee on Meat and Poultry Hygiene was tentatively scheduled to be held in Auckland, New Zealand in February 2004, subject to further consultations between the Codex and New Zealand Secretariats.

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<sup>20</sup> Under the direction of New Zealand, with the assistance of Australia, Canada, Denmark, Thailand, USA and CLITRAVI.

<sup>21</sup> CX/MPH 03/2-Add.1

<sup>22</sup> ALINORM 03/13A, paras. 82-90.

<sup>23</sup> ALINORM 03/13A, paras. 42-48.

<sup>24</sup> ALINORM 03/13A, paras. 49-54.

## SUMMARY STATUS OF WORK

Subject Matter	Step	Action by:	Document Reference (ALINORM 03/16A)
Draft General Principles for Meat Hygiene	8	Governments 26 <sup>th</sup> CAC	paras. 6-17 Appendix II
Proposed Draft Code of Hygienic Practice for Meat	5	Governments 26 <sup>th</sup> CAC Governments 10 <sup>th</sup> CCMPH	paras. 18-77 Appendix III
Proposed Draft Annex on Risk-Based Post-Mortem Examination Procedures for Meat	3	Governments New Zealand Governments 10 <sup>th</sup> CCMPH	paras. 78-91 Appendix IV
Proposed Draft Annex on Microbiological Verification of Process Control of Meat Hygiene	3	Governments New Zealand Governments 10 <sup>th</sup> CCMPH	paras. 92-103 Appendix V
Discussion Paper on Hygiene Provisions for Processed Meat	-	Governments New Zealand Governments 10 <sup>th</sup> CCMPH	paras. 104-106 CX/MPH 03/7

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**ALINORM 03/16A  
Appendix II****DRAFT GENERAL PRINCIPLES OF MEAT HYGIENE****(Advanced to Step 8)**

1. Meat must be safe and suitable for human consumption and all interested parties including government, industry and consumers have a role in achieving this outcome.<sup>1</sup>
2. The competent authority should have the legal power to set and enforce regulatory meat hygiene requirements, and have final responsibility for verifying that regulatory meat hygiene requirements are met. It should be the responsibility of the establishment operator to produce meat that is safe and suitable in accordance with regulatory meat hygiene requirements. There should be a legal obligation on relevant parties to provide any information and assistance as may be required by the competent authority.
3. Meat hygiene programmes should have as their primary goal the protection of public health and should be based on a scientific evaluation of meat-borne risks to human health and take into account all relevant food safety hazards, as identified by research, monitoring and other relevant activities.
4. The principles of food safety risk analysis should be incorporated wherever possible and appropriate in the design and implementation of meat hygiene programmes.<sup>2</sup>
5. Wherever possible and practical, competent authorities should formulate food safety objectives (FSOs) according to a risk-based approach so as to objectively express the level of hazard control that is required to meet public health goals.
6. Meat hygiene requirements should control hazards to the greatest extent practicable throughout the entire food chain. Information available from primary production should be taken into account so as to tailor meat hygiene requirements to the spectrum and prevalence of hazards in the animal population from which the meat is sourced.
7. The establishment operator should apply HACCP principles. To the greatest extent practicable, the HACCP principles should also be applied in the design and implementation of hygiene measures throughout the entire food chain.
8. The competent authority should define the role of those personnel involved in meat hygiene activities where appropriate, including the specific role of the veterinary inspector.
9. The range of activities involved in meat hygiene should be carried out by personnel with the appropriate training, knowledge, skills and ability as and where defined by the competent authority.

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<sup>1</sup> Specific meat hygiene requirements should address biological, chemical and physical hazards; and pathophysiological and other characteristics associated with suitability for human consumption

<sup>2</sup> Codex Committee on Food Hygiene, proposed draft Principles and Guidelines for the Conduct of Microbiological Risk Management (CX/FH 03/7 and ALINORM 03/13A paras. 78-98); Codex Committee on General Principles, proposed draft Working Principles for Risk Analysis, CX/GP 02/3; Report of a Joint FAO/WHO Consultation on Principles and Guidelines for Incorporating Microbiological Risk Assessment in the Development of Food Safety Standards, Guidelines and Related Texts; Kiel, Germany, 18-22 March 2002

10. The competent authority should verify that the establishment operator has adequate systems in place to trace and withdraw meat from the food chain. Communication with consumers and other interested parties should be considered and undertaken where appropriate.

11. 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.

12. 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.

**PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR MEAT****(Advanced to Step 5)**

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## PROPOSED DRAFT CODE OF HYGIENIC PRACTICE FOR MEAT

(Advanced to Step 5)

### 1. INTRODUCTION

1. Meat has traditionally been viewed as a vehicle for a significant proportion of human food-borne disease. Although the spectrum of meat-borne diseases of public health importance has changed with changing production and processing systems, continuation of the problem has been well illustrated in recent years by human surveillance studies of specific meat-borne pathogens such as *Escherichia coli* O157:H7, *Salmonella* spp., *Campylobacter* spp. and *Yersinia enterocolitica*. In addition to existing biological, chemical and physical hazards, new hazards are also appearing e.g., the agent of bovine spongiform encephalopathy (BSE). Furthermore consumers have expectations about suitability issues which are not necessarily of human health significance.

2. A contemporary risk-based approach to meat hygiene requires that hygiene measures should be applied at those points in the food chain where they will be of greatest value in reducing food-borne risks to consumers. This should be reflected in application of specific measures that are based on science and risk assessment and a greater emphasis on prevention and control of contamination during processing. Application of HACCP principles is an essential element. The measure of success of contemporary programmes is an objective demonstration of levels of hazard control in food that are correlated with required levels of consumer protection, rather than by concentrating on detailed and prescriptive measures that give an unknown outcome.

3. A number of national governments are implementing systems that redefine the respective roles of industry and government in delivering meat hygiene activities. Irrespective of the delivery systems the competent authority is responsible for defining the role of personnel involved in meat hygiene activities where appropriate, and verifying that all regulatory requirements are met.

4. The principles of food safety risk management<sup>1</sup> should be incorporated wherever appropriate in the design and implementation of meat hygiene programmes. Further, newly-recognised meat-borne risks to human health may require measures additional to those usually applied in meat hygiene, e.g., the potential for zoonotic transmission of central nervous system disorders of slaughtered livestock means that additional animal health surveillance programmes may need to be undertaken.

### 2. SCOPE AND USE OF THIS CODE

5. This proposed draft code of hygienic practice for meat further develops and applies 'The Recommended International Code of Practice: General Principles of Food Hygiene'<sup>2</sup> in the context of meat up to and including transportation. Where appropriate, the Annex to that code (Hazard Analysis and Critical Control Point System and Guidelines for its Application) and the Principles for the Establishment and Application of Microbiological Criteria for Foods<sup>3</sup> are further developed and applied in the specific context of meat hygiene.

6. For the purposes of this code, meat is that derived from domestic ungulates, domestic solipeds, domestic birds, lagomorphs, farmed game, farmed game birds (including ratites) and wild game. This Code of Practice may also be applied to other types of animals from which meat is derived, subject to any special hygienic measures required by the competent authority. Further to general hygiene measures applying to all species of animal as described above, this code also presents specific measures that apply to different species and classes of animals, e.g. wild game killed in the field.

<sup>1</sup> Proposed Draft Working Principles for Risk Analysis (CX/GP 02/3); Proposed Draft Working Principles for Microbiological Risk Management (CX/FH 01/7 and ALINORM 03/13 paras. 99-128 )

<sup>2</sup> Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1 - 1969, Rev. 3-1997, Amended 1999)

<sup>3</sup> CAC/GL 21-1997

7. Although the scope of this code is necessarily limited to production of meat, the hygiene measures that are applied should take into account further hygiene measures that are likely to be applied throughout later stages of the food chain.

8. Meat hygiene is by nature a complex activity, and this code refers to standards, texts and other recommendations developed elsewhere in the Codex system where linkages are appropriate, e.g., Principles for Food Import and Export Inspection and Certification (CAC/GL 20 - 1995), Proposed Draft Principles and Guidelines for the Conduct of Microbiological Risk Management (CX/FH 01/7 and ALINORM 03/13 paras. 99-128), General Guidelines for Use of the Term "Halal" (CAC/GL 24-1997) and recommendations of the *Ad hoc* Intergovernmental Task Force on Animal Feeding (ALINORM 01/38 and ALINORM 01/38A).

9. Subsets of the general principles (Section 4) are provided in subsequent sections within 'double-line boxes'. Where guidelines are provided at the section level, those that are more prescriptive in nature are presented in 'single-line boxes'. This is to indicate that they are recommendations based on current knowledge and practice. They should be regarded as being flexible in nature and subject to alternative provisions so long as required outcomes in terms of the safety and suitability of meat are met.

10. Traditional practices may result in departures from some of the meat hygiene recommendations presented in this code when meat is produced for local trade.

### 3. DEFINITIONS

11. For the purposes of this code, the following definitions apply. (Note that more general definitions relating to food hygiene appear in The Recommended International Code of Practice: General Principles of Food Hygiene<sup>4</sup>).

**Abattoir** Any establishment where specified animals are slaughtered and dressed for human consumption and that is approved, registered and/or listed by the competent authority for such purposes.

**Animal** Animals of the following types:

- Domestic ungulates;
- Domestic solipeds;
- Domestic birds i.e. poultry;
- Lagomorphs;
- Farmed game;
- Farmed game birds, including ratites;
- Wild game, i.e. wild land mammals and birds which are hunted (including those living in enclosed territory under conditions of freedom similar to those of wild game);
- Animals as otherwise specified by the competent authority.

**Ante-mortem examination** Any procedure or test conducted by a competent person on live animals for the purpose of judgement of safety and suitability and disposition

**Carcass** The body of an animal after dressing.

<sup>4</sup> Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1 - 1969, Rev. 3-1997, Amended 1999)

<b><i>Chemical residues</i></b>	Residues of veterinary drugs and pesticides as described in the Definitions for the Purpose of the Codex Alimentarius <sup>5</sup> .
<b><i>Competent authority</i></b>	The official authority charged by the government with the control of meat hygiene, including setting and enforcing regulatory meat hygiene requirements.
<b><i>Competent body</i></b>	A body officially recognised and overseen by the competent authority to undertake specified meat hygiene activities.
<b><i>Competent person</i></b>	A person who has the training, knowledge, skills and ability to perform an assigned task, and who is subject to requirements specified by the competent authority.
<b><i>Condemned</i></b>	Examined and judged by a competent person, or otherwise determined by the competent authority, as being unsafe or unsuitable for human consumption and requiring appropriate disposal.
<b><i>Contaminant</i></b>	Any biological or chemical agent, foreign matter, or other substance not intentionally added to food that may compromise food safety or suitability. <sup>6</sup>
<b><i>Disease or defect</i></b>	Any abnormality affecting safety and/or suitability.
<b><i>Dressing</i></b>	The progressive separation of the body of an animal into a carcass and other edible and inedible parts.
<b><i>Establishment</i></b>	A building or area used for performing meat hygiene activities that is approved, registered and/or listed by the competent authority for such purposes.
<b><i>Establishment operator</i></b>	The person in control of an establishment who is responsible for ensuring that the regulatory meat hygiene requirements are met.
<b><i>Equivalence</i></b>	The capability of different meat hygiene systems to meet the same food safety and/or suitability objectives.
<b><i>Food safety objective (FSO)</i></b>	The maximum frequency and/or concentration of a hazard in a food at the time of consumption that provides the appropriate level of protection (ALOP) <sup>7</sup> .
<b><i>Game depot</i></b>	A building in which killed wild game is temporarily held prior to transfer to an establishment, and which is approved, registered and/or listed by the competent authority for this purpose. <i>(Note that for the purposes of this code, a game depot is a particular type of establishment).</i>
<b><i>Good Hygienic Practice (GHP)</i></b>	All practices regarding the conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain. <sup>8</sup>
<b><i>Hazard</i></b>	A biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect. <sup>9</sup>
<b><i>Hunter</i></b>	A person involved in the killing and/or bleeding, partial evisceration and partial field dressing of killed wild game.

<sup>5</sup> Procedural Manual of the Codex Alimentarius Commission

<sup>6</sup> Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 3-1997, Amended 1999)

<sup>7</sup> This is an interim definition for the purpose of this Code that is subject to change depending on the final outcome from CCFH

<sup>8</sup> WHO Teachers Handbook, 1999

<sup>9</sup> Definitions for the Purpose of the Codex Alimentarius. Procedural Manual, 12<sup>th</sup> edition, page 43

<b><i>Inedible</i></b>	Examined and judged by a competent person, or otherwise determined by the competent authority to be unsuitable for human consumption.
<b><i>Meat</i></b>	All parts of an animal that are intended for, or have been judged as safe and suitable for, human consumption <sup>10</sup> .
<b><i>Meat hygiene</i></b>	All conditions and measures necessary to ensure the safety and suitability of meat at all stages of the food chain.
<b><i>Official inspector</i></b>	A competent person who is appointed, accredited or otherwise recognised by the competent authority to perform official meat hygiene activities on behalf of, or under the supervision of the competent authority.
<b><i>Organoleptic examination</i></b>	Using the senses of sight, touch, taste and smell for identification of diseases and defects.
<b><i>Performance criteria</i></b>	The required outcome of one or more control measures at a step or a combination of steps that contribute to assuring the safety of a food. <sup>11</sup>
<b><i>Primary production</i></b>	All those steps in the food chain constituting animal production and transport of animals to the abattoir, or hunting and transporting wild game to a game depot.
<b><i>Process control</i></b>	All conditions and measures applied during the production process that are necessary to achieve safety and suitability of meat. <sup>12</sup>
<b><i>Process criteria</i></b>	The process control parameters (e.g. time, temperature, dose ...) at a specified step that can be applied to achieve performance criteria <sup>13</sup> .
<b><i>Post-mortem examination</i></b>	Any procedure or test conducted by a competent person to all relevant parts of slaughtered/killed animals for the purpose of judgement of safety and suitability and disposition.
<b><i>Quality assurance (QA)</i></b>	All the planned and systematic activities implemented within the quality system and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality. <sup>14</sup>
<b><i>Quality assurance (QA) system</i></b>	The organisational structure, procedures, processes and resources needed to implement quality assurance.
<b><i>Risk-based</i></b>	Containing performance and/or process criteria developed according to risk analysis principles.
<b><i>Safe for human consumption</i></b>	Safe for human consumption according to the following criteria: <ul style="list-style-type: none"> <li>• has been produced by applying all food safety requirements appropriate to its intended end-use;</li> <li>• meets risk-based performance and process criteria for specified hazards; and</li> <li>• does not contain hazards at levels that are harmful to human health.</li> </ul>

<sup>10</sup> This does not preclude interventions for the purpose of pathogen reduction.

<sup>11</sup> This is an interim definition for the purpose of this Code that is subject to change depending on the final outcome from CCFH

<sup>12</sup> The “process” includes ante- and post-mortem examination.

<sup>13</sup> This is an interim definition for the purpose of this Code that is subject to change depending on the final outcome from CCFH

<sup>14</sup> ISO 8402

<b><i>Sanitation standard operating procedures (SSOPs)</i></b>	A documented system for assuring that personnel, facilities, equipment and utensils are clean and where necessary, sanitised to specified levels prior to and during operations.
<b><i>Suitable for human consumption</i></b>	Suitable for human consumption according to the following criteria: <ul style="list-style-type: none"> <li>• has been produced under hygienic conditions as outlined in this code;</li> <li>• is appropriate to its intended use<sup>15</sup>; and</li> <li>• meets outcome-based parameters for specified diseases or defects as established by the competent authority.</li> </ul>
<b><i>Verification (Operator)</i></b>	The continual review of process control systems, including corrective and preventative actions to ensure that regulatory and/or specified requirements are met.
<b><i>Verification</i></b>	Activities performed by the competent authority and/or competent body to determine compliance with regulatory requirements.
<b><i>Veterinary Inspector</i></b>	An official inspector who is professionally qualified as a veterinarian.

#### 4. GENERAL PRINCIPLES OF MEAT HYGIENE

Under separate development (see ALINORM 03/16A, paras. 6 - 17 and Appendix II)

#### 5. PRIMARY PRODUCTION

12. Primary production is a significant source of hazards associated with meat. A number of hazards are present in animal populations intended for slaughter and their control during primary production, often presents considerable challenges, e.g., *E. coli* O157:H7, *Salmonella* spp. *Campylobacter* spp and various chemical and physical hazards. A risk-based approach to meat hygiene includes consideration of risk management options that may have a significant impact on risk reduction when applied at the level of primary production<sup>16</sup>

13. Provision of relevant information on animals intended for slaughter facilitates application of risk-based meat hygiene programmes, and allows examination procedures to be tailor-made to the spectrum and prevalence of diseases and defects in the particular animal population.

14. Voluntary or officially recognised QA systems implemented at primary production should be appropriately taken into account during verification of regulatory requirements.

15. The principles and guidelines presented in this section are supplemental to the objectives and guidelines in Section III of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 3 1997, Amended 1999).

##### 5.1 PRINCIPLES OF MEAT HYGIENE APPLYING TO PRIMARY PRODUCTION

- i. Primary production should be managed in a way that reduces the likelihood of introduction of hazards and appropriately contributes to meat being safe and suitable for human consumption.
- ii. Whenever possible and practicable, systems should be established by the primary production sector and the competent authority, to collect, collate and make available, information on hazards and conditions that may be present in animal populations and that may affect the safety and suitability of meat.

<sup>15</sup> See for example the General Guidelines for Use of the Term "Halal" (CAC/GL 24-1997)

<sup>16</sup> Proposed Draft Working Principles for Risk Analysis (CX/GP 02/3).

- iii. Primary production should include official or officially-recognised programmes for the control and monitoring of zoonotic agents in animal populations and the environment as appropriate to the circumstances, and notifiable zoonotic diseases should be reported as required.
- iv. Good hygienic practice (GHP) at the level of primary production should involve for example the health and hygiene of animals, records of treatments, feedingstuffs and relevant environmental factors, and should include application of HACCP principles to the greatest extent practicable.
- v. Animal identification practices should allow trace-back to the place of origin to the extent practicable, to allow regulatory investigation where necessary.

## 5.2 HYGIENE OF SLAUGHTER ANIMALS

16. Both primary producers and the competent authority should work together to implement risk-based meat hygiene programmes at the level of primary production that document the general health status of slaughter animals, and implement practices that maintain or improve that status, e.g., zoonoses control programmes. QA programmes at the level of primary production should be encouraged and may include application of HACCP principles as appropriate to the circumstances. Such programmes should be taken into account by the competent authority in the overall design and implementation of risk-based meat hygiene programmes.

So as to facilitate the application of risk-based meat hygiene programmes:

- Primary producers should record relevant information to the extent possible on the health status of animals as it relates to the production of meat that is safe and suitable for human consumption. This information should be made available to the abattoir as appropriate to the circumstances.
- Systems should be in place for return from the abattoir to the primary producer, of information on the safety and suitability of slaughter animals and meat, in order to improve the hygiene on the farm and, where producer-led QA-programmes are applied, to be incorporated into these programmes to improve their effectiveness.
- The competent authority should systematically analyse monitoring and surveillance information from primary production so that meat hygiene requirements may be modified if necessary.

17. The competent authority should administer an official programme for control of specified zoonotic agents, chemical hazards and contaminants. This should be co-ordinated to the greatest extent possible with other competent authorities that may have responsibilities in public and animal health.

Official or officially-recognised programmes for specified zoonotic agents should include measures to:

- control and eradicate their presence in animal populations, or subsets of populations, e.g., particular poultry flocks;
- prevent the introduction of new zoonotic agents;
- provide monitoring systems that establish baseline data and guide a risk-based approach to control of such hazards in meat; and
- control movement of animals between primary production units, and to abattoirs, where populations are under quarantine restrictions.

Official or officially-recognised programmes for chemical hazards and contaminants should include measures to:

- control the registration and use of veterinary drugs and pesticides so that residues do not occur in meat at unsafe<sup>17</sup> levels that make the product unsafe for human consumption, and
- provide monitoring and surveillance systems that establish baseline data and guide a risk-based approach to control of such hazards in meat.

18. Animal identification systems, to the extent practicable, should be in place at primary production level so that the origin of meat can be traced back from the abattoir or establishment to the place of production of the animals.

19. Animals should not be loaded for transport to the abattoir when:

- the degree of contamination of the external surfaces of the animal is likely to compromise hygienic slaughter and dressing, and suitable interventions in further processing are not available,
- information is available to suggest that animals may compromise the production of meat that is safe and suitable for human consumption, e.g., presence of specific disease conditions or recent administration of veterinary drugs. In some situations, transport may proceed if the animals have been specifically identified (e.g. as “suspects”) and are to be slaughtered under special supervision; or
- animal stress issues may exist or arise that are likely to have an adverse impact on the safety and suitability of meat.

### 5.3 HYGIENE OF KILLED WILD GAME

20. Only limited knowledge can be gained on the health status of populations of wild game hunted for meat; however, the competent authority should consider all sources when gathering such information. In this respect, hunters should be encouraged to provide relevant information, e.g., geographical origin of wild game, and any clinical symptoms of disease observed in wild animal populations.

21. Wild game should be harvested in a manner so that:

- killing methods are consistent with the production of meat that is safe and suitable for human consumption; and
- their geographical origin is not subject to relevant official prohibitions on harvest, e.g., in the case of concurrent chemical pest control programmes or animal health quarantine.

22. Hunters are particularly important in providing information on killed animals. They should be aware of their responsibilities in terms of supplying to the establishment, all relevant information that may impact on the safety and suitability of killed wild game meat, e.g., symptoms of disease immediately before killing, grossly-apparent diseases and defects detected during partial field dressing and/or evisceration. The competent authority should require that hunters or other people involved in harvesting of wild game undergo basic training in meat hygiene appropriate to field procurement, e.g., recognition of diseases and defects, application of GHP in partial field dressing and transport to a game depot.

23. As wild game are killed in the field, appropriate hygienic practices immediately following death are essential to minimise contamination of edible parts. GHP should be applied to the extent practicable during bleeding, partial dressing, e.g., removal of the head, and/or partial evisceration (where allowed by the competent authority).<sup>18</sup>

<sup>17</sup> Guidelines for the Establishment of a Regulatory Programme for Control of Veterinary Drug Residues in Foods (CAC/GL 16-1993) (under revision)

<sup>18</sup> Partial evisceration usually only involves removal of the gastrointestinal tract, and this aides cooling

Bleeding and partial dressing of killed wild game in the field should include:

- bleeding and partial evisceration as soon as possible after killing (unless exempted by the competent authority for a particular species of wild game);
- partial skinning and/or partial dressing in a manner that minimises the level of contamination of edible parts to the lowest level practicable;
- removal only of those parts of the animal that are not necessary for post-mortem examination and judgement; and
- retention of the lungs, liver, heart and kidneys as a minimum if partial evisceration is carried out, either by natural attachment to the carcass or identified and packaged as an attachment to the carcass, unless a hunter, who is a competent person, has carried out an examination and has not detected or suspected abnormalities.<sup>19</sup>

24. Game depots should not be simultaneously used for a purpose other than receiving and holding killed wild game, unless the competent authority specifies other uses and conditions.

25. Delivery of killed wild game to a game depot or an establishment should be within time limits established by the competent authority considering harvesting, environmental conditions and desired food safety outcomes. The body and other animal parts should not be frozen before dressing and post-mortem examination in an establishment, unless unavoidable due to ambient temperatures.

#### 5.4 HYGIENE OF FEEDINGSTUFFS<sup>20</sup>

26. Feeding of animals during primary production should be subject to good animal feeding practice in the procurement, handling, storage, processing and distribution of animal feedingstuffs, and in forage crop production and pasture feeding. Records should be maintained at the manufacturing level, on the origin of feedingstuffs and/or their ingredients to facilitate verification.

27. There is a need for collaboration between all parties involved in feed production, feed manufacturing and use so as to establish any linkage between identified hazards and the level of risk to consumers that may result from transmission through the food chain<sup>21</sup>.

Animals should not be fed feedingstuffs that:

- are recognised as likely to introduce zoonotic agents (including TSEs) to the slaughter population; or
- contain chemical substances, (e.g., veterinary drugs, pesticides ) or contaminants that could result in residues in meat at levels that make the product unsafe for human consumption.

28. The competent authority should implement appropriate legislation and controls governing the feeding of animal protein to animals where there is a likelihood of transmission of zoonotic agents, and this may include a ban on such feeding when justified by risk management. Any processed feedingstuff should be subject to appropriate microbiological and other criteria, e.g., negative for *Salmonella* spp. according to a specified sampling plan, and maximum limits for mycotoxins.

#### 5.5 HYGIENE OF THE ENVIRONMENT

29. Primary production of animals should not be undertaken in areas where the presence of hazards in the environment could lead to an unacceptable level of such hazards in meat.

<sup>19</sup> In the case of small killed wild game, the competent authority may allow full evisceration

<sup>20</sup> This section is subject to alignment with the Code of Practice on Good Animal Feeding (under development). See ALINORM 03/38, Appendix II

<sup>21</sup> OIE International Animal Health Code (chapters on zoonotic diseases); OIE Guidelines on antimicrobial resistance.



The competent authority should design and administer monitoring and surveillance programmes appropriate to the circumstances, that address :

- hazards arising from animals and plants that may compromise the production of meat that is safe and suitable for human consumption;
- environmental contaminants that may result in levels in meat that make the product unsafe for human consumption; and
- ensuring that water and other potential carriers, e.g., fertilizer, are not significant vehicles for transmission of hazards.

Facilities and procedures should be in place to ensure that:

- housing and feeding platforms where used, and other areas where zoonotic agents and other hazards may accumulate, can be effectively cleaned, and are maintained in a sanitary condition (refer to Section 10);
- systems for active processing and/or disposal of dead animals and waste should not constitute a possible source of food-borne hazards to human and animal health; and
- chemical hazards required for technological reasons are stored in a manner so that they do not contaminate the environment or feedingstuffs.

## 5.6 TRANSPORT

### 5.6.1 Transport of slaughter animals

30. Transport of slaughter animals should be carried out in a manner that does not have an adverse impact on the safety and suitability of meat<sup>22</sup>.

Slaughter animals require transport facilities to the abattoir that ensure that:

- soiling and cross-contamination with faecal material is minimised;
- new hazards are not introduced during transport;
- animal identification as to the place of origin is maintained; and
- consideration is given to avoiding undue stress.

Transport vehicles should be designed and maintained so that:

- animals can be loaded, unloaded and transported easily and with minimal risk of injury;
- animals of different species, and animals of the same species likely to cause injury to one another, are physically separated during transport;
- use of floor gratings, crates or similar devices limits soiling and cross-contamination with faecal material;
- where the vehicle has more than one deck, animals are protected from cross-contamination as appropriate ;
- ventilation is adequate; and

<sup>22</sup> OIE International Animal Health Code (chapter on transport); Report of the OIE Working Group on Animal Welfare, October 2002.

- cleaning and sanitising is readily achieved (refer to Section 10).

31. Transport vehicles, and crates where used should be cleaned and if necessary sanitised as soon as practicable after animals have been unloaded at the establishment.

### **5.6.2 Transport of killed wild game**

32. Following killing and dressing in the field, the body and other parts should be transported to an establishment, including a game depot, without delay and in a manner that minimises contamination of edible parts. Vehicles used for this purpose should be consistent with good hygienic practice and any specific regulatory requirements.

33. Unless deemed unnecessary due to low environmental ambient temperatures, the temperature of the body should be actively reduced by chilling and freezing as quickly as possible after partial field dressing and transport.

## **6. PRESENTATION OF ANIMALS FOR SLAUGHTER**

34. Only healthy, clean and appropriately identified animals should be presented for slaughter.

35. Ante-mortem examination is an important pre-slaughter activity, and all relevant information on animals presented for slaughter should be utilised in meat hygiene systems.

### **6.1 PRINCIPLES OF MEAT HYGIENE APPLYING TO ANIMALS PRESENTED FOR SLAUGHTER**

- i. Animals presented for slaughter should be sufficiently clean so that they do not compromise hygienic slaughter and dressing.
- ii. The conditions of holding of animals presented for slaughter should minimise cross-contamination with food-borne pathogens and facilitate efficient slaughter and dressing.
- iii. Slaughter animals should be subjected to ante-mortem examination, with the competent authority determining the procedures and tests to be used, how examination is to be implemented, and the necessary training, knowledge, skills and ability of personnel involved.
- iv. Ante-mortem examination should be science- and risk-based as appropriate to the circumstances, and should take into account all relevant information from the level of primary production.
- v. Relevant information from primary production where available and results of ante-mortem examination should be utilised in process control.
- vi. Relevant information from ante-mortem examination should be analysed and returned to the primary producer as appropriate.

### **6.2 CONDITIONS OF LAIRAGE**

36. Holding of animals presented for slaughter has an important effect on many aspects of slaughter, dressing and the production of meat that is safe and suitable for human consumption. The cleanliness of animals has a major influence on the level of microbiological cross-contamination of the carcass and other edible parts during slaughter and dressing. A range of measures appropriate to the animal species may be applied to ensure that only animals that are sufficiently clean are slaughtered and to assist in reducing microbiological cross-contamination.

37. QA systems implemented by the establishment operator should enhance achievement of appropriate conditions of lairage on an on-going basis.

The establishment operator should ensure conditions of lairage that include:

- facilities are operated in a way that soiling and cross-contamination of animals with food-borne pathogens is minimised to the greatest extent practicable;
- holding of animals so that their physiological condition is not compromised and ante-mortem examination can be effectively carried out, e.g., animals should be adequately rested and not overcrowded and protected from weather where necessary;
- separation of different classes and types of slaughter animals as appropriate, e.g., sorting of animals by age so as to facilitate the efficiency of routine dressing, separation of animals with special dressing requirements, and separation of “suspects” that have been identified as having the potential to transfer specific food-borne pathogens to other animals (refer to 6.3);
- systems to ensure that only animals that are sufficiently clean are slaughtered;
- systems to ensure that feed has been appropriately withdrawn before slaughter;
- maintenance of identification of animals (either individually, or as lots, e.g., poultry) until the time of slaughter and dressing; and
- conveying of relevant information on individual animals or lots of animals to facilitate ante- and post-mortem examination.

38. The competent authority or the competent body should take into account QA systems properly implemented by the establishment operator, in setting the frequency and intensity of verification activities necessary to determine that the conditions of lairage are in accordance with regulatory requirements.

### 6.3 ANTE-MORTEM EXAMINATION

39. All animals presented for slaughter should be subjected to ante-mortem examination, by a competent person whether on an individual or a lot basis. Examination should include confirmation that the animals are properly identified, so that any special conditions pertaining to their place of primary production are considered in the ante-mortem examination, including relevant public and animal health quarantine controls.

40. Ante-mortem examination should support post-mortem examination by application of a specific range of procedures and/or tests that consider the behaviour, demeanour and appearance of the live animal.

41. Ante-mortem examination should be preceded by screening of animals by the establishment operator upon their arrival at the abattoir. Where abnormalities in behaviour or appearance suggest that an individual animal or a consignment of animals should be segregated, this should occur and the competent person undertaking ante-mortem examination, notified.

Animals described below should be subject to special controls, procedures or operations imposed by the competent authority (which may include denial of entry to the abattoir) when:

- animals are not sufficiently clean;
- animals have died in transit;
- a zoonotic disease posing an immediate threat to either animals or humans is present, or suspected;
- an animal health disease subject to quarantine restrictions is present, or suspected;
- animal identification requirements are not met; or
- declarations from the primary producer, if required by the competent authority (including compliance with good veterinary practice in the use of animal medicines), are absent or inadequate.

### **6.3.1 Design of ante-mortem examination systems**

42. Ante-mortem examination should be included as an integral component of an overarching risk-based system for the production of meat, with systems for process control (refer to Section 9) incorporating appropriate components. Relevant information on the slaughter population, e.g., animal class, health status, geographical region of origin, should be utilised in both the design and implementation of ante-mortem examination systems.

43. Ante-mortem examination, including procedures and tests, should be established by the competent authority according to a science and risk-based approach. In the absence of a risk-based system, procedures will have to be based on current scientific knowledge and practice.

44. Where indicated by public health concerns, measures additional to routine ante-mortem examination may be required.

Characteristics of a risk-based ante-mortem examination programme are:

- procedures for confirmation of proper animal identification in accordance with national legislation;
- design and application of organoleptic procedures and tests that are relevant and proportional to meat-borne risks associated with clinical signs of illness and grossly-detectable abnormalities;
- tailoring of procedures to the spectrum and prevalence of diseases and defects reasonably likely to be present in the slaughter population, taking into account the type of animal, geographical origin and primary production system;
- integration with HACCP-based process control to the extent practicable, e.g., application of objective criteria for ensuring appropriate cleanliness of animals presented for slaughter;
- on-going tailoring of procedures to information received from the primary production unit, where practicable;
- use of laboratory tests for hazards that are unaddressed by organoleptic examination when their presence is suspected, e.g., chemical residues and contaminants; and
- return of information to the primary producer so as to seek continuous improvement in the safety and suitability status of animals presented for slaughter (refer to 6.4).

### **6.3.2 Implementation of ante-mortem examination**

45. The competent authority should determine how ante-mortem examination is to be implemented, including identification of the components that may be applied at primary production rather than the abattoir, e.g., in the case of intensively-raised poultry.<sup>23</sup> The competent authority should establish the training, knowledge, skills and ability requirements of all personnel involved, including the role of the official inspector (and the veterinary inspector) (refer to 9.2). Verification of examination activities and judgements should be undertaken as appropriate by the competent authority or competent body. The final responsibility for verifying that all regulatory requirements are met should lie with the competent authority.

The responsibilities of the establishment operator in respect of ante-mortem examination include:

- presentation of a certificate to the competent person undertaking ante-mortem examination, stating that animals have passed ante-mortem examination when this has been carried out at the primary production unit;
- segregation of animals if, for example, they have recently given birth during transport or in lairages, or have recently aborted and/or show retained foetal membranes;

<sup>23</sup> In some cases the competent authority may allow slaughter on the farm for particular classes of animal, e.g., farmed game, and in such cases the slaughter animals should be subject to ante-mortem examination and other hygiene controls as determined by the competent authority

- applying identification systems for individual animals or lots of animals until the time of slaughter that document the outcome of ante-mortem examination, and after slaughter in the case of “suspect” animals;
- presentation of animals that are sufficiently clean; and
- prompt removal of animals that have died in the lairage, e.g., from metabolic disease, stress, suffocation, with the permission of the competent person undertaking ante-mortem examination.

46. Ante-mortem examination at the abattoir should occur as soon, as is practicable after delivery of slaughter animals. Only animals that are judged to be sufficiently rested should proceed to slaughter, but should not be withheld from slaughter any longer than necessary. Where there is an undue delay before slaughter, e.g., more than 24 hours, ante-mortem examination should be repeated.

Ante-mortem examination systems required by the competent authority should include the following:

- all relevant information from the level of primary production should be taken into account on an on-going basis, e.g., declarations from the primary producers relating to the use of veterinary drugs, information from official hazard control programmes;
- animals suspected as being unsafe or unsuitable for human consumption should be identified as such and handled separately from normal animals (refer to 6.2 and 8.2);
- results of ante-mortem examination are made available to the competent person undertaking post-mortem examination before animals are examined at the post-mortem stations so as to augment final judgement. This is particularly important when a competent person undertaking ante-mortem examination, judges that a suspect animal can proceed to slaughter under special hygiene conditions.;
- in more equivocal situations, the competent person undertaking ante-mortem examination may hold the animal (or lot) in special facilities for more detailed examination, diagnostic tests, and/or treatment;
- animals condemned as unsafe or unsuitable for human consumption should be immediately identified as such and handled in a manner that does not result in cross-contamination of other animals with food-borne hazards (refer to 8.2); and
- the reason for condemnation should be recorded, with confirmatory laboratory tests being carried out if deemed necessary. Feed back of this information to the primary producer should take place.

47. Slaughter of animals under an official or officially-recognised programme for the eradication or control of a specific zoonotic disease, e.g., salmonellosis, should only be carried out under the hygiene conditions specified by the competent authority.

### **6.3.3 Ante-mortem judgement categories**

Ante-mortem judgement categories include:

- passed for slaughter;
- passed for slaughter subject to a second ante-mortem examination, after an additional holding period, e.g., when animals are insufficiently rested, or are temporarily affected by a physiological or metabolic condition;
- passed for slaughter under special conditions i.e. deferred slaughter as “suspects”, where the competent person undertaking ante-mortem examination suspects that post-mortem examination findings could result in partial or total condemnation;

- condemned for public health reasons i.e. due to: meat-borne hazards, occupational health hazards, or likelihood of unacceptable contamination of the slaughter and dressing environment following slaughter<sup>24</sup>;
- condemned for meat suitability reasons;
- emergency slaughter, when an animal eligible for being passed under special conditions could deteriorate if there was a delay in slaughter; and
- condemned for animal health reasons, as specified in relevant national legislation, and disposed of accordingly.

#### **6.4 INFORMATION ON ANIMALS PRESENTED FOR SLAUGHTER**

48. Information provided on animals presented for slaughter may be an important determinant of optimal slaughter and dressing procedures and is a prerequisite for effective design and implementation of process control by the establishment operator. The competent authority should analyse relevant information and take it into account when setting hygiene requirements for risk-based hygiene systems throughout the entire food chain (refer to 9.2).

49. The competent authority may require monitoring of animals presented for slaughter to establish baseline information on the prevalence of hazards in the slaughter population, e.g., specified meat-borne pathogens, chemical residues greater than maximum residue limits. The competent authority should design and implement these monitoring activities according to national public health goals. Scientific analysis and dissemination of results to interested parties is the responsibility of the competent authority.

So as to facilitate science- and risk-based meat hygiene throughout the entire food chain, systems should be in place that provide:

- on-going information on animals presented for slaughter for incorporation into HACCP plans and/or QA programmes that are part of process control;
- information back to the primary producer on the safety and suitability status of animals presented for slaughter; and
- information to the competent authority that facilitates on-going review.

### **7. PRESENTATION OF KILLED WILD GAME FOR DRESSING**

50. Killed wild game presented at an establishment have been subject to different harvesting, handling and transportation arrangements compared to live animals presented for slaughter. Killed wild game should undergo an appropriate examination before dressing and full post-mortem examination commences, so as to prevent undue contamination of the dressing environment and wastage of resources.

#### **7.1 PRINCIPLES OF MEAT HYGIENE APPLYING TO EXAMINATION OF KILLED WILD GAME PRESENTED FOR DRESSING**

- i. Examination of killed wild game for safety and suitability prior to dressing should be risk-based to the extent practicable, and should take into account relevant information available from the field.

<sup>24</sup> The competent person may judge, after post-mortem examination in special facilities, that edible parts of the animal can be salvaged for a particular purpose e.g. pet-food

## **7.2 EXAMINATION OF KILLED WILD GAME PRESENTED FOR DRESSING**

51. The examination should determine to the extent possible whether hygienic practice for field-harvested animals has been appropriately applied, including an assessment of cleanliness sufficient for hygienic dressing. Special measures required by the competent authority to facilitate post-mortem examination, e.g., correct identification and attachment of viscera separated from the carcass (refer to 5.3), should be confirmed at this time.

52. The examination should take into account any information available from harvesting in the field, e.g., presence of abnormalities at the time of death, geographical location. Where practicable, the results should be returned to hunters or other people involved in harvesting of wild game so as to improve their knowledge of and contribution to meat hygiene.

53. Examination of killed wild game for safety and suitability prior to dressing should be risk-based to the extent practicable, given that the entire animal may not be presented for dressing, e.g., the gastrointestinal tract of large killed wild game will most likely have been discarded in the field. Examination procedures prior to dressing and post-mortem examination, will be necessarily limited in nature. They should be focused on detecting abnormalities intrinsic to field harvesting of wild game, e.g. signs of natural death or the animal being moribund at the time of death, the effects of a misplaced or expanding bullet, decomposition, and any evidence of intoxication with poisons or environmental contaminants. Systems for the implementation of examination procedures and judgements should be based on those used for ante-mortem examination of other classes of animals (refer to 6.3).

54. Identify of the body of the animal along with those parts required for post-mortem examination, should be maintained until final post-mortem judgement.

## **8. ESTABLISHMENTS: DESIGN, FACILITIES AND EQUIPMENT**

55. The principles and guidelines presented in this section are supplemental to the objectives and guidelines in Section IV of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 3 1997, Amended 1999).

56. The competent authority should allow variations in the design and construction of game depots and establishments processing killed wild game, and their facilities, where they are by necessity impermanent, as long as meat hygiene is not compromised.

### **8.1 PRINCIPLES OF MEAT HYGIENE APPLYING TO ESTABLISHMENTS, FACILITIES AND EQUIPMENT**

- i. Establishments should be located, designed and constructed so that contamination of meat is minimised to the greatest extent practicable.
- ii. Facilities and equipment should be designed, constructed and maintained so that contamination of meat is minimised to the greatest extent practicable.
- iii. Establishments, facilities and equipment should be designed to allow personnel to carry out their activities in a hygienic manner.
- iv. Facilities and equipment that are in direct contact with edible parts of animals and meat, should be designed and constructed so that they can be effectively cleaned and monitored for their hygiene status.
- v. Suitable equipment should be available for control of temperature, humidity and other factors as appropriate to the particular processing system for meat.
- vi. Water should be potable except where water of a different standard can be used without leading to contamination of meat.

57. Each establishment should have appropriate facilities and equipment for competent persons to properly carry out their meat hygiene activities.

58. Laboratory facilities necessary to support meat hygiene activities may be located in the establishment or provided at a separate location.

## 8.2 DESIGN AND CONSTRUCTION OF LAIRAGES

59. Lairages should be designed and constructed so that they do not lead to undue soiling of the animal, cause undue stress of the animal, or otherwise adversely impact on the safety and suitability of meat derived from animals held therein.

Lairages should be designed and constructed so that:

- animals can be held without overcrowding or injury, and are not exposed to climatic stress;<sup>25</sup>
- there are appropriate layout and facilities for cleaning and/or drying of animals;
- ante-mortem examination is facilitated;
- floors are paved or slatted and allow good drainage;
- there is an adequate supply and reticulation of clean water for drinking and cleaning, and facilities are provided for feeding where necessary;
- there is a physical separation between lairages and areas of an abattoir where edible material may be present;
- “Suspect” animals can be segregated and examined in separate areas.<sup>26</sup> These areas should include facilities that are capable of secure holding of “suspect” animals pending slaughter under supervision, and should have separate and contained drainage; and
- there is an adjacent area with adequate facilities for cleaning and sanitation of transport vehicles and crates, unless there are facilities within close distance that are approved by the competent authority.

60. Special facilities may be required to handle condemned animals.

These facilities should be:

- constructed so that all parts, gut contents and faeces from condemned animals can be held under secure containment as appropriate to the circumstances; and
- constructed and equipped so as to facilitate effective cleaning and sanitation (refer to Section 10).

## 8.3 DESIGN AND CONSTRUCTION OF SLAUGHTER AREAS

61. Stunning and bleeding areas should be separated from dressing areas (either physically or by distance), so that cross-contamination of animals is minimised.

62. Areas for scalding, dehairing, defeathering, scraping and singeing (or similar operations) should also be appropriately separated from dressing areas.

63. Where slaughter is carried out the processing line should be designed so that there is constant progress of animals in a manner that does not cause cross-contamination.

64. Special facilities may be required to slaughter and dress “suspect” or injured animals.

<sup>25</sup> In the case of poultry and farmed game birds, facilities should be available to park transport vehicles in areas that are well ventilated, and are protected from direct sunlight, inclement weather and extremes of temperature

<sup>26</sup> In the case of poultry and farmed game birds, “suspect” birds are usually slaughtered on the slaughter line under special hygiene provisions



Where these facilities exist they should be:

- easily accessed from pens containing “suspect” or injured animals;
- constructed with suitable facilities for hygienic storage of parts derived from “suspect” or injured animals; and
- constructed and equipped so as to facilitate effective cleaning and sanitising (refer to Section 10).

#### **8.4 DESIGN AND CONSTRUCTION OF AREAS WHERE BODIES OF ANIMALS ARE DRESSED OR MEAT MAY OTHERWISE BE PRESENT**

65. All areas and facilities where bodies of animals are dressed or meat may be present should be designed and constructed so that they allow GHP,<sup>27</sup> and contamination of meat is minimised to the greatest extent practicable.

Rooms and other areas in which bodies of animals are dressed or meat may be present should be designed and constructed so that:

- cross-contamination during operations is minimised to the greatest extent practicable;
- effective cleaning, sanitation and maintenance can be carried out during and between periods of operation; (refer to Section 10);
- floors in areas where water is present slope sufficiently to grilles or otherwise protected outlets so as to ensure continual drainage;
- exterior doors not open directly into the area;
- chutes separately conveying different parts of animals are fitted with examination and cleaning hatches where these are necessary for sanitation;
- separate rooms are used for:
  - skin-on dressing of pigs or other animals, when other classes of animals are being dressed at the same time;
  - emptying and cleansing of alimentary tracts, and further preparation of clean alimentary tracts, unless such separation is deemed unnecessary;
  - handling of meat and inedible parts of animals after they have been so designated, unless these products are otherwise separated by time or distance;
  - storage of inedible animal parts such as hides, horns, hooves, feathers and inedible fats;
- there is adequate natural or artificial lighting for hygienic process control;
- there are appropriate facilities for the preparation and storage of edible fats;
- access and harbouring of pests are effectively restricted; and
- adequate facilities are provided for secure storage of chemicals, (e.g., cleaning materials, lubricants, branding inks) and other hazardous substances so as to prevent accidental contamination of meat.

66. Appropriately designed and insulated rooms should be available as necessary for cooling, chilling and freezing of meat.

Establishments that de-bone or otherwise cut up meat should have for this purpose:

- facilities that allow constant progress of operations or that ensure separation between different production batches;

<sup>27</sup> Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1 - 1969, Rev. 3-1997, Amended 1999)

- a room or rooms, capable of being temperature-controlled; and
- separation of the boning, cutting and primary wrapping area from the packaging area, unless hygiene measures are in place to ensure that packaging does not contaminate meat.

67. Drainage and waste disposal systems should not be a source of contamination of meat, the potable water supply or the processing environment. All lines should be watertight and adequately trapped and vented, with catch basins, traps and sumps that are isolated from any area where animals are dressed or meat may be present.

68. Establishments should have an appropriate area, sufficiently protected from environmental contamination and capable of preventing adverse temperature variations, for dispatching meat.

#### **8.5 DESIGN AND CONSTRUCTION OF EQUIPMENT WHERE BODIES OF ANIMALS ARE DRESSED OR MEAT MAY BE PRESENT**

69. All equipment used in areas where bodies of animals are dressed or meat may be present should facilitate GHP. Equipment and containers in rooms and other areas where bodies of animals are dressed or meat may be present should be designed and constructed so that contamination is minimised. Meat should not be allowed to contact the floor and walls, or fixed structures not designed for such contact.

70. Where slaughter lines are operated, they should be designed so that there is constant progress of carcasses and other parts, in a manner that prevents cross-contamination between different parts of the slaughter line and between different slaughter lines.

71. All rooms and other areas in which animals are dressed or meat may be present should be equipped with adequate facilities for washing hands, and should be equipped with adequate facilities for cleaning and sanitation of implements where required (refer to Section 10).

Facilities for cleaning and sanitation of equipment should:

- be designed to effectively clean and sanitise the particular equipment;
- be located convenient to work stations; and
- have waste water ducted to drains.

72. Equipment and implements for use with inedible or condemned parts of animals should be distinctively identified.

73. Establishments should be provided with adequate means of natural or mechanical ventilation so as to prevent excessive heat, humidity and condensation, and ensure that air is not contaminated with odours, dust or smoke.

Ventilation systems should be designed and constructed so that:

- air-borne contamination from aerosols and condensation droplets is minimised;
- ambient temperatures, humidity and odours are controlled; and
- air flow from contaminated areas, (e.g., slaughter and dressing areas) to clean areas, (e.g., chilling rooms for carcasses) is minimised.

## 8.6 WATER SUPPLY<sup>28</sup>

74. Adequate facilities should be provided for monitoring and maintaining potability, storage, temperature control, distribution of water and for the disposal of waste water.

Equipment should be installed that provides:

- an adequate and easily accessible supply of hot and cold potable water at all times;
- hot potable water for effective sanitising of equipment, or an equivalent sanitation system;
- potable water at a temperature appropriate for hand-washing; and
- sanitising solution used according to manufacturers' specifications supplied as and where necessary;

75. Where non-potable water is supplied for various uses e.g., fire fighting, steam production, refrigeration, reticulation systems should be designed so that cross-contamination of the potable water supply is prevented.

## 8.7 TEMPERATURE CONTROL

76. In the absence of suitable temperature, humidity and other environmental controls, meat is particularly vulnerable to survival and growth of pathogens and spoilage micro-organisms.

77. Facilities and equipment should be adequate for:

- Cooling, chilling and/or freezing of meat according to written specifications;
- Storage of meat at temperatures that achieve the safety and suitability requirements; and
- Monitoring of temperature, humidity, air flow and other environmental factors so as to assure that process control regimes are achieved.

## 8.8 FACILITIES AND EQUIPMENT FOR PERSONAL HYGIENE

78. Slaughter, dressing and further handling of bodies of animals and parts, present many opportunities for cross-contamination of meat by food handlers (refer to Section 11). Appropriate personal hygiene facilities are needed to minimise cross-contamination of meat from this source.

79. Facilities and equipment should be provided, designed and located so that meat safety is not compromised. Where necessary, separate amenities should be provided e.g. for staff handling live animals, condemned products (refer Section 11).

Facilities for personal hygiene should include:

- changing rooms, showers, flush toilets, hand-washing and hand-drying facilities where necessary, and separate areas for eating; and
- protective clothing that can be effectively cleaned and minimises accumulation of contaminants.

All areas in which exposed meat may be present, should be equipped with adequate facilities for washing hands that:

- are located convenient to work stations;
- have taps that are not operable by hand;

<sup>28</sup> Recommended International Code of Practice: General Principles of Food Hygiene, Section 5.5 (CAC/RCP 1-1969, Rev. 3-1997, Amended 1999)

- supply water at an appropriate temperature, and are fitted with dispensers for liquid soap or other hand cleansing agents;
- include hand drying equipment where necessary, and receptacles for discarded paper towels; and
- have waste water ducted to drains.

## 8.9 TRANSPORT VEHICLES

Vehicles or shipping containers in which meat is transported should:

- be designed and equipped so that the meat does not contact the floor;
- have joint and door seals that prevent entry of all sources of contamination; and
- where necessary, be equipped so that temperature control and humidity can be maintained and monitored.

## 9. PROCESS CONTROL

80. An extensive range of hazards are associated with meat, e.g., *Salmonella* spp. and veterinary drug residues, the processing environment, e.g., *Listeria monocytogenes* and *Clostridium perfringens*, and food handlers themselves, e.g., *Staphylococcus aureus* and hepatitis viruses. Effective process control, that includes both GHP and HACCP, is necessary to produce meat that is safe and suitable for human consumption.

81. The principles and guidelines presented in this section should satisfy the general objectives and guidelines in Section V of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 3-1997). They are developed in this section in respect of hazards in meat however they are equally applicable to suitability characteristics.

82. Many aspects of slaughter and dressing procedures have the potential to result in significant contamination of meat, e.g., hide/feather removal, evisceration, carcass washing, post-mortem examination, trimming, and further handling in the cold chain. Systems for process control should limit microbial cross-contamination in these circumstances to as low as practicably achievable, and reflect the proportional contribution of these controls in reducing meat-borne risks to human health.

### 9.1 PRINCIPLES OF MEAT HYGIENE APPLYING TO PROCESS CONTROL

- i. Production of meat that is safe and suitable for human consumption requires that detailed attention be paid to the design, implementation, monitoring and review of process control.
- ii. The establishment operator has the primary responsibility for implementing systems for process control. Where such systems are applied, the competent authority should verify that they achieve all meat hygiene requirements.
- iii. Process control should limit the level of microbiological contamination to the lowest level practicable, according to a risk-based approach.
- iv. HACCP should be applied wherever practicable as the system of choice for process control, and should be supported by prerequisite GHP that includes SSOPs.
- v. Process control should reflect an integrated strategy for control of hazards throughout the food chain, with information available from primary production and pre-slaughter being taken into account wherever possible and practicable.

- vi. All bodies of animals should be subjected to post-mortem examination that is science- and risk-based, and is tailored to the hazards and/or defects that are reasonably likely to be present in the bodies of animals presented for examination.<sup>29</sup>
- vii. The competent authority should determine the procedures and tests to be used in post-mortem examination, how that examination is to be implemented, and the necessary training, knowledge, skills and ability required of personnel involved (including the role of veterinarians, and personnel employed by the establishment operator).
- viii. Post-mortem examination should take into account all relevant information from primary production, ante-mortem examination, and from official or officially-recognised hazard control programmes.
- ix. Post-mortem judgements should be based on: food-borne risks to human health, other human health risks, e.g., from occupational exposure or handling of meat in the home, food-borne risks to animal health as specified in relevant national legislation, and suitability characteristics.
- x. Performance criteria for the outcome of process control and post-mortem examination activities should be established by the competent authority wherever practicable, and should be subject to verification by the competent authority.
- xi. Competent bodies or competent persons may be engaged by the establishment operator to undertake prescribed process control activities<sup>30</sup>, including ante-<sup>31</sup> and post-mortem examination, as approved by the competent authority.
- xii. Voluntary or officially recognised QA systems maybe implemented by the establishment operator where they enhance meat hygiene activities, and they may be taken into account in the verification of regulatory requirements by the competent authority.

## 9.2 PROCESS CONTROL SYSTEMS

83. Effective process control requires design and implementation of appropriate systems. Industry has the primary responsibility for applying and supervising process control systems to ensure the safety and suitability of meat, and these should incorporate prerequisite GHP and HACCP plans as appropriate to the circumstances.

84. A documented process control system should describe the meat hygiene activities applied (including any sampling procedures), performance criteria (if set), verification activities, and corrective and preventative actions.

85. Competent bodies or competent persons suitably recognised by the competent authority may be engaged by the establishment operator to undertake prescribed process control activities, including post-mortem examination. These activities should be part of HACCP or QA systems as appropriate to the circumstances.

86. Process control systems relating to food safety should incorporate a risk-based approach. Application of HACCP principles in the design and implementation of process control systems should be according to The Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application (CAC/RCP 1-1969, Rev. 3 1997, Amended 1999). The Guidelines for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems (CAC/GL 26-1997) provide general requirements for control of operations for food as they relate to international trade.

<sup>29</sup> Where risk assessment capability is not available, post-mortem examination carried out according to current scientific knowledge and practice should be capable of achieving the level of consumer protection required

<sup>30</sup> Prescribed process control activities may include “Officially Recognised Inspection Systems” (CAC/GL 20-1995)

<sup>31</sup> Ante-mortem examination as covered in Section 6.3

### **9.2.1 Sanitation Standard Operating Procedures (SSOPs)**

87. Pre-operational and operational SSOPs should minimise direct and indirect contamination of meat to the greatest extent possible and practicable. A properly implemented SSOP system should ensure that facilities and equipment are clean and sanitised prior to start of operations, and appropriate hygiene is maintained during operations. SSOP guidelines may be provided by the competent authority, which may include minimum regulatory requirements for general sanitation.

Characteristics of SSOPs are:

- development of a written SSOP programme by the establishment that describes the procedures involved and the frequency of application;
- identification of establishment personnel responsible for implementing and monitoring SSOPs;
- documentation of monitoring and any corrective and/or preventative actions taken, which is made available to the competent authority for purposes of verification;
- corrective actions that include appropriate disposition of product; and
- periodic evaluation of the effectiveness of the system by the establishment operator.

88. Microbiological verification of SSOPs can utilise a range of direct or indirect methods. Establishment operators should use statistical process control or other methods to monitor sanitation trends.

### **9.2.2 HACCP**

89. HACCP systems for production of meat are a proactive means of process control for food safety purposes.<sup>32</sup> Validation of a HACCP plan for meat should ensure that it is effective in meeting performance criteria (refer 9.2.3), taking into account the degree of variability in presence of hazards that is normally associated with different lots of animals presented for processing.

90. Verification frequency may vary according to the operational aspects of process control, the historical performance of the establishment in application of the HACCP plan, and the results of verification itself. The competent authority may choose to approve HACCP plans and stipulate verification frequencies.

91. Microbiological testing for verification of HACCP systems, e.g. for verification of critical limits and statistical process control, is an important feature of HACCP.

### **9.2.3 Outcome-based parameters for process control**

92. In a risk-based meat hygiene system, verification of process control is greatly strengthened by establishment of performance criteria for the outcome of specified activities. In most cases these will be established by the competent authority. When performance criteria are established, industry can use them to readily demonstrate adequate process control for food safety characteristics of meat.

93. The establishment should have a documented process control system for implementing corrective actions that will allow it to consistently meet performance criteria. Process review and any other corrective actions required as a result of non-compliance with performance criteria should be properly recorded. The competent authority should implement a system for collecting and analysing results from all establishments to the greatest extent possible, and periodically review process control trends in relation to national meat hygiene goals.

94. Where possible, performance criteria should objectively express the level of hazard control as derived from the application of risk analysis principles. In the absence of sufficient knowledge of risks to human health, performance criteria can initially be established from baseline surveys of current performance, and subsequently

<sup>32</sup> Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application, (Annex to CAC/RCP 1-1969, Rev. 3-1997, Amended 1999)

modified as appropriate to reflect public health goals. Where outcome-based parameters have been established for suitability characteristics of meat, outcomes should be practically achievable and reflect consumer expectations.

95. Organoleptic parameters may also be established e.g., “zero tolerance” for visible faecal contamination on carcasses.

Performance criteria for outcomes of process control systems act to:

- facilitate validation of process control systems;
- facilitate derivation of process parameters at various steps in the food production system;
- allow maximum flexibility and technical innovation in the way the establishment operator achieves the required level of performance;
- facilitate industry-wide consistency in performance;
- provide an objective basis for outcome-driven regulatory guidelines and standards, e.g., statistical process control requirements, prevalence of *Salmonella* spp.;
- improve hazard control over time so as to enhance the level of consumer protection; and
- facilitate determination of the equivalence of sanitary measures.

96. Where performance criteria are established as regulatory requirements, explanation of the linkage to an appropriate level of consumer protection should be provided to all interested parties, e.g., guidelines for allowable levels of generic *E. coli*, standards for absence of *E. coli* O157:H7, maximum residue limits for chemicals with acute toxicity.

97. In some circumstances a performance criteria may be established as a microbiological criterion that defines the acceptability of a production lot, e.g. based on the presence/absence or number of microbes, and/or the quantity of their toxins or metabolites according to a specified sampling plan.<sup>33</sup>

98. Performance criteria for outcomes of process control may be difficult to establish for some hazards of concern, and the competent authority may need to implement specific procedures and tests to achieve expected levels of consumer protection, e.g. BSE. Specific measures such as these should be implemented on the basis of risk assessment and full consideration of the effectiveness of all available risk management options<sup>34</sup>.

99. The competent authority should recognise different risk-based meat hygiene activities within its competence, which have been demonstrated to meet at least the same risk-based meat hygiene outcomes.

#### **9.2.4 Regulatory systems**

100. The competent authority should have the legal power to set and enforce regulatory meat hygiene requirements, and has the final responsibility for verifying that all regulatory requirements are met. The competent authority should:

- i. Establish regulatory systems (e.g. recall, traceback, product tracing, as appropriate, etc.) and requirements, e.g. training, knowledge, skills and ability of personnel (generally at a national level).
- ii. Undertake specified meat hygiene controls that are designated activities of the competent authority, e.g., official sampling programmes, those aspects of ante and post-mortem activities specified by the competent authority, or official certification.

<sup>33</sup> Principles for the Establishment and Application of Microbiological Criteria for Foods (CAC/GL 21-1997)

<sup>34</sup> Bovine spongiform encephalopathy. Chapter 2.3.13. International Animal Health Code - 2000. Office International des Epizooties

- iii. Verify that process control systems implemented by the establishment operator meet regulatory requirements i.e. GHP, SSOPs, HACCP, as appropriate.
- iv. Verify that competent bodies are carrying out functions as required.
- v. Carry out enforcement actions as necessary.

The competent authority should verify compliance with:

- GHP requirements for: animals presented for slaughter (and killed wild game presented for dressing), establishments, facilities and equipment, process control, transport, and hygiene of personnel;
- SSOPs;
- HACCP plans;
- all regulatory requirements relating to ante- and post-mortem examination;
- performance and process parameters that are regulatory requirements, e.g., microbiological statistical process control requirements, standards for *Salmonella* spp.
- chemical residue and contaminant levels that are below maximum limits as described in relevant legislation and national sampling plans;
- official or “officially-recognised” zoonoses control programmes, e.g., microbiological tests for *E. coli* O157:H7; and
- additional risk management measures as specified by the competent authority.

101. Verification activities may include assessment of processing activities carried out by establishment personnel, documentary checks, organoleptic examination of edible parts and meat, taking of samples for laboratory tests and testing for pathogens, indicator organisms, residues, etc. Approval/registration/listing of an establishment may facilitate the ability of the competent authority to verify that it is operating in compliance with regulatory requirements.

102. The competent authority should conduct appropriate supervision of (operator) verification activities, and the nature and intensity of that supervision should be risk-based. The official inspector (including the veterinary inspector) verifies compliance with the regulatory requirements and may use additional documentary checks, procedures and tests in this role. Rules governing the presence of the official inspector during ante- and post-mortem examination, and during processing, cutting, and storage of meat, should be determined by the competent authority in relation to deployment of other competent persons, and in relation to potential risks to human health associated with the classes of animals and meat involved, the type of establishment, the operator, etc.

103. A national meat hygiene programme should be subject to verification by the competent authority.

Where the establishment operator does not comply with regulatory requirements, the competent authority should carry out enforcement actions that may include:

- slowing of production while the operator regains process control;
- stopping production, and withdrawing certification for meat deemed to be unsafe or unsuitable for its intended use;
- withdrawing official supervision, or accreditation of competent;
- ordering specified treatment, recall or destruction of meat as necessary; and
- withdrawing or suspending all or part of the approval/registration/listing of the establishment if process control systems are invalid or repeatedly non-compliant.



### **9.2.5 Quality assurance (QA) systems**

104. Whenever there are verifiable QA systems in place in the industry, the competent authority should take them into account.<sup>35</sup>

### **9.3 GENERAL HYGIENE REQUIREMENTS FOR PROCESS CONTROL**

105. Process control should meet the general hygiene requirements of the Recommended International Code of Practice: General Principles of Food Hygiene.<sup>36</sup>

General hygiene requirements for process control should include for example:

- water for cleaning and sanitising of a standard that is appropriate for the specific purpose, and used in a manner that does not directly or indirectly contaminate meat;
- cleaning of facilities and equipment that involves disassembly where necessary, removal of all debris, rinsing of parts, application of an approved cleaner, repeat rinsing, reassembly, and further sanitisation and rinsing as appropriate;
- handling and storage of containers and equipment in a way that minimises the potential for contamination of meat;
- assembly of containers or cartons in rooms or areas where meat may be present in such a manner that there is minimal possibility of contamination; and
- controlled access of personnel to processing areas.

106. The competent authority and industry should utilise appropriately accredited or otherwise recognised laboratories when verifying process control and carrying out other meat hygiene activities. Testing of samples should utilise validated analytical methods.<sup>37</sup>

Laboratory testing may be required for:

- verification of process control;
- application of performance or microbiological criteria;
- residue monitoring;
- diagnosis of disease conditions affecting individual animals; and
- monitoring of zoonoses.

### **9.4 HYGIENE REQUIREMENTS FOR SLAUGHTER AND DRESSING**

107. Only live animals intended for slaughter should be brought into an abattoir, with the exception of animals that have undergone emergency slaughter outside the slaughterhouse and have appropriate veterinary documentation.

108. No animal other than an animal intended for slaughter should enter an abattoir, with the exception of animals used for stock handling.

<sup>35</sup> Guidelines for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems - Section 4 "Quality Assurance" (CAC/GL 26-1997)

<sup>36</sup> Note that general requirements for control of incoming materials, use of water, packaging, documentation and records, and recall procedures are described in the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1 - 1969, Rev. 3-1997, Amended 1999)

<sup>37</sup> Guidelines for the Assessment of the Competence of Testing Laboratories Involved in the Import and Export Control of Food (CAC/GL 27-1997)

109. An animal should only be slaughtered or dressed in an abattoir if a competent person is available to undertake ante- and post-mortem examination. In cases of emergency slaughter where a competent person is not available, special provisions established by the competent authority will apply to ensure that the meat is safe and suitable for human consumption.

110. All animals brought to the slaughter floor should be slaughtered without delay, and stunning, sticking and bleeding of animals should not proceed at a rate faster than that at which carcasses can be accepted for dressing.

During initial dressing operations, and with due consideration to minimising contamination:

- slaughtered animals that are scalded, flamed or similarly treated should be scoured of all bristles, hair, scurf, feathers, cuticles and dirt;
- the trachea and oesophagus should remain intact during bleeding, except in the case of ritual slaughter;
- bleeding should be as complete as possible; if blood is intended for food, it should be collected and handled in a hygienic manner;
- exposure of the tongue should be done in such a way that the tonsils are not cut;
- skinning of the head may not be required for some classes of animals e.g. goats, calves, sheep, provided that heads are handled in such a way as to avoid undue contamination of meat;
- before the removal from the head of any parts intended for human consumption, the head should be clean and, except in the case of scalded and dehaired carcasses, skinned to an extent sufficient to facilitate examination and the hygienic removal of specified parts;
- lactating or obviously-diseased udders should be removed from carcasses at the earliest opportunity;
- removal of udders should be done in such a way that the contents do not contaminate the carcass;
- gas skinning or dehiding (pumping of air or gas between the skin or hide and the underlying tissue to facilitate skinning) should only be permitted if it can be achieved with minimal contamination and meets required microbiological and organoleptic performance criteria; and
- hides/fleeces should not be washed, de-fleshed or left to accumulate in any part of an abattoir or establishment that is used for slaughter or dressing.

111. Poultry and farmed game birds, following de-feathering, can only be effectively cleaned of dust, feathers and other contaminants by the application of potable water. Washing of the carcasses of these animals at multiple steps in the dressing process, and as soon as possible after each contaminating step, reduces the adherence of bacteria to the skin and can minimise overall carcass contamination. (Washing after evisceration and post-mortem is also necessary for technological reasons, as this is the only method available to routinely clean carcasses before entry to the chilling process). Washing may be carried out by several methods e.g., spraying, immersion washing.

112. Farmed ratites may have an excessive amount of dust and dirt trapped in their feathers, and this has the potential for significant contamination of the dressing area unless there is adequate separation by distance, physical barrier, or other means, e.g., positive ventilation.

113. Once the removal of the hide/fleece has commenced, or dehairing has occurred, carcasses should be separated from each other to avoid contact, and this should be maintained until each carcass has been examined and judged by a competent person undertaking post-mortem examination. (Note: While full separation of carcasses is more difficult in the case of poultry and farmed game birds, such contact should be minimised).

During dressing, and with due consideration to minimising contamination:

- where bodies of animals are skinned, this process should be completed before evisceration;
- water in scalding tanks should be managed so that it is not excessively contaminated;

- evisceration should be carried out without delay;
- discharge or spillage of any material from the oesophagus, crop, stomach, intestines, cloaca or rectum, or from the gall bladder, urinary bladder, uterus or udder, should be prevented;
- intestines should not be severed from the stomach during evisceration and no other opening should be made into an intestine, unless the intestines are first effectively tied to prevent spillage, except in the case of poultry and game birds;
- stomachs and intestines and all inedible material derived from the slaughtering and/or dressing of bodies of animals should be removed as soon as possible from the dressing area, and processed in a manner that does not cause cross-contamination of meat;
- methods used to remove visible and microbial contamination should be demonstrated to be effective and meet other requirements as specified by the competent authority; and
- faecal and other material should be trimmed or otherwise removed from carcasses in a manner that does not result in further contamination, and which achieves appropriate performance criteria for process control.

114. Carcasses should not come into contact with surfaces or equipment unless practically unavoidable. Where use of equipment involves contact by design, e.g., in the case of automatic eviscerating machines, the hygiene of the equipment should be appropriately maintained and monitored.

115. Where a competent person undertaking post-mortem examination, considers that the manner in which animals are being slaughtered or dressed, or meat is further handled, will adversely affect the safety and suitability of meat, that competent person should enforce a reduction in the rate of production or the suspension of operations or other appropriate measures, as deemed necessary (refer to 9.2.4).

116. Establishment operators should meet the requirements of the competent authority in terms of presentation of edible parts of bodies of animals for post-mortem examination. Parts of slaughtered animals that have been removed before post-mortem examination is performed should remain identifiable, as belonging to a single carcass (or a group of carcasses) when required for post-mortem judgement.

117. Facilities and equipment for slaughtering and/or dressing may be used for other purposes, e.g. for animal health emergency slaughter, provided appropriate cleaning and sanitation requirements are met.

118. The competent authority should encourage development and adoption of innovative technologies and procedures at the establishment level, that reduce cross-contamination and enhance food safety, e.g., enclosing the terminal rectal intestine in a bag and tying off.

## **9.5 POST-MORTEM EXAMINATION**

119. All carcasses and other relevant parts should be subjected to post-mortem examination, which preferably should be part of an overarching, risk-based system for the production of meat.

120. Post-mortem examination of carcasses and other relevant parts should utilise information from primary production and ante-mortem examination, together with the findings from organoleptic examination of the head, carcass and viscera, to make a judgement on the safety and suitability of parts intended for human consumption. Where the results of organoleptic examination are insufficient to accurately judge carcasses and other relevant parts as safe or suitable for human consumption, the parts should be set aside and followed up with confirmatory examination procedures and/or tests.

### **9.5.1 Design of post-mortem examination systems**

121. Post-mortem examination procedures and tests should be established by the competent authority according to a science- and risk-based approach. The competent authority has responsibility for establishing judgement criteria and verifying the post-mortem examination system. In the absence of a risk-based system, procedures will have to be based on current scientific knowledge and practice.

122. Relevant information on the animal population, e.g., animal type, health status, geographical region of origin, should be utilised in both the design and implementation of post-mortem examination systems.

123. Where indicated by public health concerns, routine screening of carcasses and other relevant parts by methods other than organoleptic examination may be required for suspected hazards, e.g., testing for *Trichinella* spp.

Characteristics of a risk-based post-mortem examination programme are:

- design and application of organoleptic procedures and tests that are relevant and proportional to meat-borne risks associated with grossly-detectable abnormalities;
- tailoring of procedures to the spectrum and prevalence of diseases and defects reasonably likely to be present in the particular slaughter population, taking into account the type (age), geographical origin and primary production system of the slaughter animals, e.g., multiple incisions of relevant muscles in all pigs from geographical regions where *Taenia solium* is present;
- procedures that minimise cross-contamination through handling to the greatest extent practicable, and may include procedures that are limited to visual observation of carcasses and other relevant parts in the first instance if justified by risk assessment;
- examination of non-edible parts of animals where they may play an indicator role in the judgement of edible parts;
- modification of traditional procedures where scientific investigation has shown them to be ineffective, or, of themselves, hazardous to food, e.g., routine incision of lymph nodes of young animals to detect granulomatous abnormalities;
- application of more intensive organoleptic procedures on a routine basis when a disease or condition capable of general distribution is found in a single part of a carcass and other relevant parts, e.g., cysts of *Taenia saginata* in cattle, xanthosis;
- application of additional risk-based examination procedures on a routine basis when live animals are positive to a diagnostic test, e.g., tuberculin test in cattle, mallein test in horses;
- use of laboratory tests for hazards that are unaddressed by organoleptic examination, e.g., *Trichinella* spp., chemical residues and contaminants;
- application of performance criteria for outcomes of organoleptic examination that reflect a risk-based approach;
- integration with HACCP plans for other process control activities, e.g., establishment of “zero faecal tolerance” criteria for faecal contamination of carcasses;
- on-going tailoring of procedures to take into consideration information received from the primary producer on a lot-by-lot basis; and
- return of information to the primary producer so as to seek continuous improvement in the safety and suitability status of animals presented for slaughter (refer to 6.4).

### **9.5.2 Implementation of post-mortem examination**

124. Post-mortem examination should occur as soon as is practicable after slaughter of animals, or delivery of killed wild game animals. Examination should take into account all relevant information from the level of primary production and ante-mortem examination, e.g. information from official or officially-recognised hazard control programmes, information on animals slaughtered as “suspects”.

125. The competent authority should determine: how post-mortem examination is to be implemented, the training, knowledge, skills and ability required of personnel involved (including the role of the official inspector, the veterinary inspector, and any personnel not employed by the competent authority), and the frequency and intensity of verification activities (refer to 9.2.4). The final responsibility for verifying that all post-mortem examination and judgement requirements are met should lie with the competent authority.

126. Carcasses and other relevant parts condemned by the competent person undertaking post-mortem examination, as unsafe or unsuitable for human consumption should be identified as appropriate and handled in a manner that does not result in cross-contamination of meat from other carcasses and relevant parts. The reason for condemnation should be recorded, and confirmatory laboratory tests may be taken if deemed necessary.

The responsibilities of the establishment operator in respect of post-mortem examination include:

- maintenance of the identity of a carcass and other relevant parts (including blood as appropriate) until examination is complete;
- skinning and dressing of heads to the extent necessary to facilitate examination, e.g., partial skinning to allow access to sub-maxillary lymph nodes, detaching of the base of the tongue to allow access to the retropharyngeal lymph nodes;
- skinning of heads to the extent necessary to allow hygienic removal of edible parts, when this is a processing option;
- presentation of a carcass and other relevant parts for examination according to the requirements of the competent authority;
- a prohibition on establishment personnel intentionally removing or modifying any evidence of a disease or defect, or animal identification mark, prior to post mortem examination;
- prompt removal of fetuses from the evisceration area, for rendering or other processes as allowed by the competent authority, e.g., collection of foetal blood;
- retention in the examination area of all carcasses and other relevant parts required for examination, until examination and judgement has been completed;
- provision of facilities for identifying and retaining all carcasses and other relevant parts that require more detailed examination and/or diagnostic tests before a judgement on safety and suitability can be made, in a manner that prevents cross-contamination of meat from other carcasses and other relevant parts;
- condemnation of parts of the carcass trimmed from the region of the sticking wound;
- routine condemnation of the liver and/or kidneys from older animals where the competent authority has determined that there may be accumulation of heavy metals to an unacceptable level;
- use of health marks (as specified by the competent authority) that communicate the outcome of post-mortem examination; and
- co-operation with competent persons undertaking post-mortem examination, in all other ways necessary to facilitate effective post-mortem examination, e.g., access to processing records, and easy access to all carcasses and other relevant parts.

Post-mortem examination systems, should include:

- procedures and tests that are risk-based to the extent possible and practicable (refer to 9.5.1);
- confirmation of proper stunning and bleeding;
- availability of examination as soon as is practicable after completion of dressing;
- visual examination of the carcass and other relevant parts, including inedible parts, as determined by the competent authority;
- palpation and/or incision of the carcass and other relevant parts, including inedible parts, as determined by the competent authority according to a risk-based approach;
- additional palpation and/or incisions, as necessary to reach a judgement for an individual carcass and other relevant parts, and under appropriate hygiene control

- more detailed examination of edible parts intended for human consumption compared with examination of those parts for indicator purposes alone, as appropriate to the circumstances;
- systematic, multiple incisions of lymph nodes where incision is necessary;
- other organoleptic examination procedures, e.g., smell, touch;
- where necessary, laboratory diagnostic and other tests carried out by the competent authority or by the establishment operator under instruction;
- performance criteria for the outcomes of organoleptic examination;
- regulatory authority to slow or halt processing so as to allow adequate post-mortem examination at all times;
- removal of specified parts if required by the competent authority, e.g., “specified risk materials” for BSE; and
- proper use and secure storage of equipment for health marking.

127. The competent authority and industry should record and disseminate the results of post-mortem examination as appropriate. Notifiable human or animal health diseases and cases of non-complying residues or contaminants should be reported to national competent authorities as well as to the owner of the animal(s). Analysis of the results of post-mortem examination over time is the responsibility of the competent authority, and the results of such analyses should be made available to all interested parties.

#### 9.6 POST-MORTEM JUDGEMENT

128. Post-mortem judgement of edible parts as safe and suitable for human consumption should primarily be based on food-borne risks to human health. Other risks to human health, e.g., from occupational exposure or from handling of meat in the home, also are an important consideration. Judgements in relation to suitability characteristics of meat should reflect consumer acceptability requirements appropriate to intended end-use.<sup>38</sup>

129. Although outside the mandate of Codex, post-mortem examination programmes may be utilised to identify and judge carcasses and other relevant parts according to risks to animal health, as specified in relevant national legislation.

Judgement of edible parts as safe and suitable should take into account information from the following sources:

- information from primary production (refer to Section 6);
- observations made of animals in the lairage;
- ante-mortem examination; and
- post-mortem examination, including diagnostic tests, where required.

130. Judgements should be based on science and risks to human health to the greatest extent possible, with guidelines being provided by the competent authority. Judgements should only be made by competent persons. When edible parts with any abnormality are always judged to be unsafe and unsuitable for human consumption and appropriately disposed of, the level of training, knowledge, skills and ability required for judgement may be less than in situations where edible parts demonstrating an abnormality may not necessarily be removed from the food supply.

131. Where the initial results of post-mortem examination are insufficient to accurately judge edible parts as safe or suitable for human consumption, a provisional judgement should be followed up with more detailed examination procedures and/or tests. Pending the outcome of more detailed examination and/or diagnostic tests, all

<sup>38</sup> The competent authority may take into account varying needs of different consumer populations so that suitability judgements do not distort the economics of the food supply

parts of the animal that are required for further investigation should be held under the control of the competent person undertaking these activities.

Judgement categories for edible parts include:

- safe and suitable for human consumption;
- safe and suitable for human consumption, subject to application of a prescribed process, e.g., cooking, freezing;<sup>39</sup>
- held on suspicion of being unsafe or unsuitable, pending the outcome of further procedures and/or tests.
- unsafe for human consumption i.e. due to meat-borne hazards or occupational health/meat handling hazards, but able to be used for some other purpose, e.g., pet-food, animal feedingstuffs, industrial non-food use, providing there are adequate hygiene controls to prevent any transmission of hazards, or illegal re-entry to the human food chain;
- unsafe for human consumption i.e. due to meat-borne hazards or occupational health/meat handling hazards, and requiring condemnation and destruction;
- unsuitable for human consumption, but able to be used for some other purpose, e.g., pet-food, animal feedingstuffs, industrial non-food use, providing there are adequate controls to prevent illegal re-entry to the human food chain;
- unsuitable for human consumption, and requiring condemnation and destruction; and
- unsafe for animal health reasons as specified in national legislation, and disposed of accordingly.<sup>40</sup>

132. When edible parts are judged to be safe and suitable for human consumption subject to application of a prescribed process, the specifications for that process should be verified by the competent authority as sufficient to eliminate/reduce or adequately remove the hazard or condition of concern, e.g., specifications for retorting, high temperature rendering and freezing.

#### **9.7 HYGIENE REQUIREMENTS FOR PROCESS CONTROL AFTER POST-MORTEM EXAMINATION**

133. Operations following post-mortem examination include chilling of carcasses, de-boning and cutting, packaging, freezing and storing. Particular attention needs to be paid to temperature control, with temperatures of freshly slaughtered and dressed carcasses and other edible parts being reduced as rapidly as possible to a temperature that minimise the growth of micro-organisms or the formation of toxins that could constitute a risk to human health. It is also important that the cold chain is not interrupted except to the minimal extent necessary for practical operations, e.g., handling during transportation.

134. In the case of poultry and farmed game birds, viscera or parts of viscera, apart from kidneys, should be entirely removed as soon as possible, unless otherwise permitted by the competent authority.

Meat passed as safe and suitable for human consumption should be:

- removed without delay from the dressing area;
- handled, stored and transported in a manner that will protect it from contamination and deterioration;
- held under conditions that reduce its temperature and/or water activity as quickly as possible, unless cut up or de-boned pre-rigor; and

<sup>39</sup> The competent person can instruct that following post-mortem examination, edible parts held under suitable inventory control can be designated as safe and suitable when subjected to a particular process e.g. freezing, cooking, canning

<sup>40</sup> In some circumstances, edible parts may be judged as suitable for human consumption but subject to restricted distribution because the animals were sourced from geographical areas under quarantine for animal health reasons

- held at temperatures that achieve safety and suitability objectives.

In the case of poultry or farmed game birds undergoing immersion chilling:

- the immersion chilling process should meet hygiene criteria as specified by the competent authority;
- the reduction in carcass temperature should be as rapid as possible;
- carcasses emerging from the process should have a lesser microbiological count for indicator organisms and pathogens than those entering the process; and
- sanitation requirements should include complete emptying, cleaning and sanitation of tanks as appropriate.

135. An official health mark applied to meat, wrapping or packaging, should provide recognition that the product has been produced in accordance with regulatory requirements, and should assist with trace-back to the establishment of origin if required. When used as part of an official meat hygiene programme, the health mark should include the approval/registration/listing number of the establishment, be applied in such a way that it cannot be re-used, and be legible. Other marks may denote conformance with commercial specifications, or unacceptability for human consumption, e.g., distinctive brands for pet-food.

136. Official health marks may be applied directly to the product, wrapping or packaging, or be printed on a label affixed to the product, wrapping or packaging. In circumstances of bulk transport to another establishment for further handling, processing or wrapping, health marks may be applied to the external surface of the container or packaging.

Where carcasses, parts of carcasses or other meat is placed in a holding room:

- all requirements for hygienic control of operations must be adhered to e.g., chiller loading rates, stock rotation, specifications for temperature and relative humidity;
- carcasses and parts of carcasses, whether hung or placed in racks or trays, should be held in a manner permitting adequate circulation of air;
- the potential for cross-contamination via dripping of fluids should be prevented; and
- water dripping from overhead facilities and condensation should be controlled to the extent practicable, to prevent contamination of meat and food contact surfaces.

137. Rooms and equipment for cutting, de-boning or further preparing meat should be reserved for those purposes alone, with rooms being maintained at a required temperature and humidity during operations. Meat intended for cutting or de-boning should be brought into work rooms progressively as needed, and should not accumulate on work tables. If meat is cut or de-boned prior to reaching temperatures that are appropriate for storage and transport, it must be immediately reduced in temperature to prescribed levels.

When meat is cut or de-boned pre-rigor:

- it should be transported directly from the dressing area to the cutting up or de-boning room;
- the cutting up or de-boning room should be temperature-controlled and directly linked to the dressing areas, unless the competent authority approves alternative procedures that provide an equivalent level of hygiene; and
- cutting up, de-boning and packing should be done without delay and should meet all requirements for hygienic process control.



Where meat is packaged or wrapped:

- packaging material should be suitable for use, stored and used in a hygienic manner; and
- cases or cartons should have a suitable inner liner or other means of protecting the meat, except that the liner or other protection may not be required if pieces of meat, such as cuts, are individually wrapped before packing.

Where meat is placed in a room for freezing:

- meat that is not in cartons should be hung or placed on racks or trays in a manner that allows adequate circulation of air;
- meat that is not in cartons should be held in a manner whereby the potential for cross-contamination via dripping of liquids is prevented;
- cartons containing meat should be stacked so as to permit adequate circulation of air; and
- meat held on trays should be placed so as to avoid contact with the base of an upper tray.

Where meat is held in a freezer room or storage facility:

- the temperature of the meat should have been reduced to an acceptable level before placement;
- exposed meat must be stored in such a way that the hygiene cannot be compromised by the presence of packaged meat or packaging material;
- meat, whether in carcass form or in cartons, should not be stacked directly on the floor and should be positioned so that there is adequate air circulation;
- the freezer store should be operated and maintained under conditions appropriate to maintaining the safety and suitability of meat;
- temperatures should be continuously recorded and monitored; and
- adequate inventory control should be maintained.

138. Where meat is thawed for further processing, hygiene controls should be such that thawing will not result in growth of micro-organisms or the formation of toxins to the extent that they may constitute a risk to human health. Hygiene controls should include adequate drainage of liquid run-off.

139. Where establishments are approved, registered and/or listed for different animal species, all operations must be controlled in terms of space or time so that there is no possibility of accidental mixing of meat from different slaughter species, and no mis-identification at the time of packaging.

#### **9.8 HYGIENE REQUIREMENTS FOR PARTS OF ANIMALS DEEMED UNSAFE OR UNSUITABLE FOR HUMAN CONSUMPTION**

140. Special hygiene measures should be applied to operations involving parts of animals deemed unsafe or unsuitable for human consumption. These measures should prevent cross-contamination to other edible parts and meat, and prevent any possibility of substitution.

Parts of animals deemed unsafe or unsuitable for human consumption should be:

- placed without delay into specifically identified chutes, containers, trolleys, or other handling facilities;
- identified by means as appropriate to the type and end use of the tissue;
- in the case of condemned material, handled in rooms reserved for that purpose and conveyed in a secure manner to a place of disposal (e.g. rendering station).

## 9.9 RECALL SYSTEMS

141. Establishments should have adequate systems that enable the tracing and withdrawal of product from the food chain. The competent authority should require verification that the systems are adequate. In the case of a recall, communication with consumers and interested parties should be considered, and undertaken where appropriate.

142. Recalled product may be used for purposes other than human consumption, where appropriate, or reprocessed in a manner that ensures safety and suitability.

Recall systems designed by the establishment operator should:

- utilise the approval/registration/listing number of the establishment as a means to identify meat to its final destination;
- incorporate management systems and procedures that facilitate rapid and complete recall of implicated lots e.g. distribution records, lot coding;
- keep records that facilitate trace-back to the place of origin of the animals, to the extent practicable; and
- keep records that facilitate investigation of any processing inputs that may be implicated as a source of hazards.

## 10. ESTABLISHMENTS: MAINTENANCE AND SANITATION

143. The principles and guidelines presented in this section are supplemental to the objectives and guidelines in Section VI of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 3 1997, Amended 1999).

### 10.1 PRINCIPLES OF MEAT HYGIENE APPLYING TO MAINTENANCE AND SANITATION OF ESTABLISHMENTS, FACILITIES AND EQUIPMENT

- i. Establishments, facilities and equipment should be maintained and sanitised in such a manner that contamination of meat is minimised to the greatest extent practicable.
- ii. Documented programmes for effective and appropriate maintenance and sanitation should be in place (refer to 9.2.1).
- iii. Monitoring of the effectiveness of maintenance and sanitation should be included as a basic component of meat hygiene programmes (refer to 9.2.1).
- iv. Special sanitation requirements should be applied to the slaughter and dressing of animals that are condemned or designated as “suspects”.

## 10.2 MAINTENANCE AND SANITATION

144. Establishments, facilities and equipment should be kept in an appropriate state of repair and condition to facilitate all sanitation procedures and prevent contamination of meat, e.g., from metal shards, flaking plaster and chemical contaminants.

145. SSOPs should specify the scope of the cleaning programme, cleaning specifications, persons responsible, and monitoring and record keeping requirements.

Cleaning procedures and programmes should:

- be specified in SSOPs as appropriate to the circumstances;
- provide for removal and storage of waste;
- ensure that there is no consequential contamination of meat with detergents or sanitising agents, unless allowable under conditions of use; and
- be monitored for their effectiveness, e.g., organoleptic checks and microbiological sampling of meat contact surfaces, and be redesigned if and when necessary.

146. Particular cleaning programmes are required for equipment used in the slaughter and dressing of carcasses e.g., knives, saws, machine cutters, evisceration machines and flushing nozzles.

Such equipment should be:

- clean and sanitised before each new period of work;
- cleaned, and sanitised, by immersion in hot water or alternative methods, with appropriate frequency during and/or between periods of work;
- immediately cleaned and sanitised when coming into contact with abnormal or diseased tissue that may harbour food-borne pathogens; and
- stored in designated areas in such a manner that it will not become contaminated.

147. Containers and equipment should not pass from an “inedible” area to an “edible” area before being cleaned and sanitised.

148. Pest control programmes are an essential part of maintenance and sanitation and should follow GHP as described in the Recommended International Code of Practice: General Principles of Food Hygiene.<sup>41</sup>

In particular:

- the programme should be properly documented and verified by the establishment operator;
- treatment of areas, rooms, facilities and equipment, with an approved pesticide should be carried out according to the conditions of use; and
- pesticides and other pest control chemicals should be kept in secure storage, with access being limited to authorised persons.

<sup>41</sup> Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1 - 1969, Rev. 3-1997, Amended 1999)

## 11. PERSONAL HYGIENE

149. Slaughter and dressing of animals, and handling and examination of meat, presents many opportunities for cross-contamination. Personal hygiene practices should prevent undue general contamination, and prevent cross-contamination with human pathogens that may cause food-borne disease. The guidelines presented in this section are supplemental to the objectives and guidelines in Section VII of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 3 1997).

### 11.1 PERSONAL CLEANLINESS

150. Persons who come into direct or indirect contact with edible parts of animals or meat in the course of their work should maintain appropriate personal cleanliness and behaviour, and should not be clinically affected by communicable agents likely to be transmitted by meat.

Persons who come into direct or indirect contact with edible parts of animals or meat should:

- maintain an appropriate standard of personal cleanliness;
- wear protective clothing appropriate to the circumstances, and ensure that non-disposable protective clothing is cleaned before and during work;
- if wearing gloves during the slaughter and dressing of animals and the handling of meat, ensure that they are of an approved type for the particular activity, e.g., chain-mail stainless steel, synthetic fabric, latex, and they are used according to specifications, e.g., washing of hands before use, changing or sanitising gloves when contaminated;
- immediately wash and sanitise hands and protective clothing when there has been contact with abnormal animal parts that are likely to harbour food-borne pathogens;
- cover cuts and wounds with waterproof dressings; and
- store protective clothing and personal effects in amenities that are separate from areas where meat may be present.

### 11.2 PERSONAL HEALTH STATUS

151. The establishment should maintain relevant personal health records of personnel.

Persons who come into direct or indirect contact with edible parts of animals or meat in the course of their work should:

- where necessary, have a medical examination prior to and, during employment;
- not work while clinically affected by, or suspected to be carrying, communicable agents likely to be transmitted through meat; and
- be aware of and comply with reporting requirements to the establishment operator in respect of communicable agent.

## 12. TRANSPORTATION

152. The guidelines presented in this section are supplemental to the objectives and guidelines in Section VIII of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 3-1997, Amended 1999).

153. Due to the potential for growth of pathogenic and spoilage micro-organisms under conditions of inadequate temperature control, meat should be transported at temperatures that achieve safety and suitability objectives. Equipment for continuous monitoring and recording of temperatures should accompany transport

vehicles and bulk containers wherever appropriate. Additionally, the conditions of transport should provide adequate protection from exogenous contamination and damage, and should minimise growth of pathogenic and spoilage micro-organisms.

154. If meat is inadvertently exposed to adverse temperature conditions or sources of contamination that may affect safety and suitability, an examination should be carried out by a competent person before further transport or distribution is allowed.

### **13. PRODUCT INFORMATION AND CONSUMER AWARENESS**

155. Appropriate product information and adequate knowledge of food hygiene is necessary to prevent mishandling at later stages in the food chain. Pre-packaged foods should be labelled with clear instructions to enable the next person in the food chain to handle, display, store and use the product safely. Principles and guidelines for product information and consumer awareness in the context of safety and suitability of meat are described in general terms in Section IX of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 3 1997, Amended 1999).

### **14. TRAINING**

156. Adequate training of competent personnel is of fundamental importance in the production of meat that is safe and suitable for human consumption. The principles and guidelines presented in this section are supplemental to the objectives and guidelines in Section X of the Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev 3-1997, Amended 1999).

#### **14.1 PRINCIPLES OF TRAINING IN MEAT HYGIENE**

Persons engaged in meat hygiene activities should be trained, and/or instructed to a required level of training, knowledge, skills, and ability. Training specified or recognised by the competent authority, should be:

- i. appropriate to the activities and operations;
- ii. proportional to the potential of the particular meat hygiene activity to impact on food-borne risks to human health;
- iii. properly documented, including records of training programme delivery;
- iv. verified as appropriate; and
- v. subject to recognition by the competent authority where delivered by third parties.

#### **14.2 TRAINING PROGRAMMES**

Training programmes should:

- provide personnel with the training, knowledge, skills and ability to carry out specified meat hygiene tasks, e.g., post-mortem examination, verification of statistical process control, HACCP;
- provide practical training to the extent required;
- where necessary, arrange for formal testing of personnel;
- ensure that personnel involved in supervisory roles have appropriate skills;
- recognise and build on professional qualifications; and
- provide for the continuing education of competent persons.

**ALINORM 03/16A**  
**Appendix IV****PROPOSED DRAFT ANNEX ON RISK-BASED<sup>1</sup> POST-MORTEM EXAMINATION PROCEDURES  
FOR MEAT  
(at Step 3)****1. Introduction**

1. Post-mortem meat examination procedures are a set of food hygiene measures that are unique to the production of meat. Such procedures are regarded as a component of overall process control, which is defined as “all conditions and measures applied during the production process that are necessary to achieve safety and suitability of meat”<sup>2</sup>.
2. The General Principles of Food Hygiene state that “in deciding whether a [food control] requirement is necessary or appropriate, an assessment of the risk should be made, preferably within the framework of the HACCP approach”<sup>3</sup>. Traditional post-mortem meat examination procedures are often complex, labour-intensive, undifferentiated for different classes of slaughtered livestock, and poorly evaluated in terms of their relative contribution to reducing food-borne risks to public health. For these reasons, competent authorities in a number of countries are carrying out investigations into the scientific basis of current procedures<sup>4</sup>.
3. Although the principles and guidelines presented in this Annex can be adapted to evaluation of post-mortem examination procedures for determining the suitability of meat, such methodology is not developed.

**2. Objectives of risk-based post-mortem examination procedures for meat**

4. A risk-based approach to post-mortem examination for meat can achieve the following objectives:
  - Determination of the level of consumer protection provided by specified post-mortem examination procedures;
  - Relative measurement of the contribution of post-mortem examination to the overall level of control of hazards in meat (and risks to consumers), thereby allowing risk managers to allocate meat hygiene resources proportionate to their greatest benefit in preventing meat-borne risks;
  - Comparison of the effectiveness of different examination procedures applied for the same purpose and in the same context;
  - Provision of information that allows appropriate evaluation of different risk management options e.g. regionalisation of examination programmes, feasibility and comparative costs of different post-mortem examination procedures, potential for cross-contamination;
  - Full integration of post-mortem examination procedures into a “production-to-consumption” meat hygiene programme.

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<sup>1</sup> The term “risk-based” can be applied to a food safety measure, a group of measures, a food safety programme or a food safety system. For the purposes of the CCMH, “risk-based” is defined as “containing performance and/or process parameters developed according to risk analysis principles”

<sup>2</sup> Proposed Draft Code of Hygienic Practice for Fresh Meat (CX/MPH 3/4)

<sup>3</sup> Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 3-1997, Amended 1999)

<sup>4</sup> Competent authorities have different approaches to defining the respective roles of industry and competent authority personnel in delivering meat hygiene activities, and this issue is not covered in this Annex

### **3. Risk analysis**

#### **3.1. Risk management framework**

5. Development and implementation of risk-based post-mortem examination procedures should utilise a risk management framework<sup>5</sup>. The four components are: preliminary risk management activities, evaluation of risk management options, implementation, and monitoring and review. Utilisation of a risk management framework is the subject of on-going work within the Codex system, and is described in a number of Codex documents<sup>6</sup>.

#### **3.2. Risk assessment**

6. If required, a risk assessment is commissioned during preliminary risk management activities. A risk assessment consists of four steps: hazard identification, hazard characterisation, exposure assessment, and risk characterisation. The output of this process should be qualitatively integrated with all other factors relating to post-mortem meat examination to make risk management decisions on appropriate procedures for control of hazards.

7. In the ideal situation, risk estimates will be quantified in terms of risks to human health, and risk management decisions on an appropriate level of protection (ALOP) will dictate the nature and intensity of the post-mortem examination procedures to be applied. However, risk assessment of microbiological hazards in meat is currently limited by a lack of quantitative risk assessment models. Nevertheless, appropriate assembly of scientific information and qualitative risk characterisation as to the probable impacts on human health can provide an objective basis for decision-making. In the latter case, risk management decisions will revolve around the acceptability of the likely human health impact of differences in hazard levels brought about by different examination procedures.

#### **3.3. Performance and process criteria**

8. An understanding of the level of consumer protection that is achieved by particular examination procedures requires knowledge of the level of control of hazards that is attained in meat. A performance parameter<sup>7</sup> provides a measure of that level of control. Performance attributes for post-mortem examination procedures (see Section 5.4) may be regarded as process criteria<sup>8</sup> if they can be validated as achieving performance criteria.

### **4. General principles for development of risk-based post-mortem meat examination procedures**

- i. Risk-based post-mortem examination procedures should be derived from the application of risk analysis principles.
- ii. Development of risk-based post-mortem examination procedures should:
  - Involve application of a risk management framework to the greatest extent appropriate and practicable;
  - Include quantitative risk assessment where appropriate and practicable;
  - Take into account all relevant information available from the food chain.
- iii. Examination procedures should be evaluated for application within a specific context e.g. species and class of slaughtered animal, defined geographical region, defined animal husbandry system.
- iv. Where different examination procedures that have the same purpose and context are being evaluated:

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<sup>5</sup> Proposed Draft Working Principles for Risk Analysis for Application in the Framework of the Codex Alimentarius. ALINORM 03/33 Appendix II

<sup>6</sup> Risk Analysis Policies of the Codex Alimentarius Commission. Twenty-fourth Session of the CAC. ALINORM 01/9

<sup>7</sup> For the purposes of the CCMH, a performance parameter is defined as “an expression of the required level of hazard control at a specified step that is considered necessary to achieve the appropriate level of protection”

<sup>8</sup> For the purposes of the CCMH, a process parameter is defined as “a measurable or quantifiable characteristic at a specified step or combination of steps that can achieve a performance parameter”

- An objective basis for comparison of the level of control of hazards should be established;
  - The efficacy of each examination procedure in detecting abnormalities affecting the suitability of meat should be taken into account;
  - Other risk management factors should be taken into account as appropriate e.g. potential for inadvertent cross-contamination, feasibility, and practicality.
- v. Where needed, representative and sufficiently large field trials should be undertaken to determine the performance attributes of specified examination procedures e.g. sensitivity, specificity, and non-detection rates for grossly-detectable abnormalities.
- vi. Laboratory investigations of abnormal and grossly-normal tissue should be designed to detect the range of hazards of possible public health importance that have been described in hazard identification.
- vii. Routine application of post-mortem examination procedures should not inadvertently increase cross-contamination with microbiological hazards.
- viii. Irrespective of examination delivery systems, the competent authority should be responsible for defining the role of personnel involved in post-mortem examination procedures, and verifying that any process criteria expressed as regulatory guidelines or standards are met.

## **5. Guidelines for the development of risk-based post-mortem examination procedures**

### **5.1. Identification of the Meat Hygiene Issues**

9. An hazard identification process should be undertaken to determine the likely range of hazards of public health significance that may be present in grossly-detectable abnormalities in target tissues.

### **5.2. Field trials**

10. Field trials should be carried out under appropriate veterinary supervision and employing competent personnel. The number of animals examined by the inspection procedures under evaluation should be sufficiently large so as to give an estimate of the true prevalence of gross abnormalities achieved by specific post-mortem examination procedures.

11. Sampling plans should be representative of the slaughter population, and cater for known biological variation in respect of the type and prevalence of grossly-detectable abnormalities e.g. influence of animal age, geographical region, farming type and season. Different trial designs may be employed, depending on the prevalence of grossly-detectable abnormalities in the slaughter population, the logistics of detailed (“gold standard”) examination, and the number of competent persons available.

12. Where different post-mortem examination procedures are being compared: all procedures should be applied to the same animals, each examination station should be designed to provide independent results, and the trial should include enough samples so as to allow definite conclusions as to the consequences of changing examination procedures. The possibility of target tissues acting as “indicators” for detection of gross abnormalities in other tissues and/or disposition of other tissues should be included in the design of field trials. Detailed recording of trial results is necessary, including appropriate pathological descriptions of all abnormalities detected.

13. Laboratory investigations e.g. microbiological examination and histology, should be designed to identify the range of hazards of possible public health importance that have been identified in the hazard identification process. A representative number and range of samples should be taken from grossly-detectable abnormalities, so as to confirm the outcome of the hazard identification process and provide as much information as possible on the prevalence (and concentration) of hazards in target tissue. Trial design should include representative surveying of the prevalence (and concentration) of hazards in target tissues that are grossly normal, so as to provide a comparison with the prevalence (and concentration) of hazards in those tissues that are grossly abnormal.



### 5.3 *Performance attributes*

14. The performance attributes of the examination procedures e.g. visual examination, palpation, and/or incision, should be determined within appropriate statistical confidence limits. The intended end-use of the target tissues has an important influence on the development of risk-based post-mortem examination procedures.

15. The sensitivity of an examination procedure is the probability of correctly identifying gross abnormalities that are likely to contain public health hazards. An examination procedure with a high sensitivity will result in a low non-detection rate for abnormalities containing hazards i.e. few false negatives.

16. The specificity of an examination procedure is the probability of correctly identifying gross abnormalities that do not contain public health hazards, and hence only constitute a suitability issue. An examination procedure with a high specificity will result in a low detection rate for abnormalities that do not contain hazards i.e. few false positives.

17. The true prevalence of grossly-detectable abnormalities affecting the tissues subject to post-mortem examination (“gold standard”) should be determined as part of the above process.

### 5.4 *Risk management decisions*

18. Risk management decisions on the acceptability or otherwise of specified post-mortem examination procedures will generally be based on the worst case of non-detection of gross abnormalities included in an appropriate statistical confidence interval. Decisions should take into account the comparative public health risks associated with:

- The prevalence (and concentration) of hazards in target tissues that are grossly abnormal;
- The prevalence (and concentration) of hazards in target tissues that are grossly normal;
- The overall prevalence (and concentration) of hazards being transmitted by all pathways throughout the production of meat.

19. In the general case, new or alternative examination procedures should provide a level of consumer protection that is at least equivalent to that provided by traditional procedures, unless there are strong mitigating factors that may influence a different risk management choice e.g. unacceptable introduction of new hazards, undue risks from occupational exposure.

20. Required regulatory outcomes for post-mortem examination may include process criteria expressed as limits on non-detection rates for particular abnormalities. Those process criteria may be derived quantitatively from risk assessment models, or qualitatively from baseline surveys of current industry performance.

21. Where detailed information on the health status of slaughtered animals is available from primary production, risk-based post-mortem examination procedures may be modified on a lot-by-lot basis.

22. The competent authority should regularly analyse results of post-mortem examination at both the establishment and national level, and provide appropriate feedback to establishments and other interested parties on the performance of risk-based post-mortem examination procedures.

23. The competent authority may change presentation requirements and the sequence of examination procedures as a result of scientific evaluation of different post-mortem examination procedures, and allow introduction of new examination tools e.g. mirrors. Alternative technologies for detecting abnormalities e.g. tissue imaging, should be acceptable to the competent authority if validated as being as effective as organoleptic procedures.

**ALINORM 03/16A**  
**Appendix V****PROPOSED DRAFT ANNEX ON**  
**MICROBIOLOGICAL VERIFICATION OF PROCESS CONTROL OF MEAT HYGIENE**  
**(at Step 3)****1. Introduction**

1. Microbiological monitoring at specific points in the food chain is increasing in importance as a tool for ensuring a risk-based approach to food safety. Specification of food safety microbiological outcomes assures that appropriate levels of consumer protection are achieved, while providing maximum flexibility to industry in terms of the detailed process control systems that are employed.
2. The General Principles of Food Hygiene<sup>1</sup> state that “in deciding whether a [food control] requirement is necessary or appropriate, an assessment of the risk should be made, preferably within the framework of the HACCP approach”, and any microbiological specifications “should be based on sound scientific principles and state, where appropriate, monitoring procedures, analytical methods and action limits”<sup>2</sup>. Process control is defined as “all conditions and measures applied during the production process that are necessary to achieve safety and suitability of meat”<sup>3</sup>.
3. As described in this Annex, microbiological performance criteria for monitoring of meat<sup>4</sup> are different to microbiological criteria for judging the acceptability of a process, product or food lot<sup>5</sup>. Although not included in the scope of this Annex, microbiological monitoring of meat may also be used to ensure suitability.

**2. Objectives of microbiological monitoring of process control for meat**

4. A preventative, HACCP-based approach should be regarded as the most effective means of ensuring microbiological process control requirements. Once process control has been properly validated, microbiological monitoring should be limited to that level necessary to verify that required food safety outcomes are being met on an on-going basis.
5. Microbiological monitoring of process control of meat provides a tool for:
  - Verification of the adequacy of establishment process control in relation to faecal and other contamination;
  - Assurance of the level of control of specified hazards of public health importance;
  - Facilitating development of process criteria at a specified step or combination of steps that achieve microbiological performance criteria;
  - Review and redesign of HACCP plans;
  - Objective comparison of the outcome of different process control systems in different situations;
  - Provision of export assurances by competent authorities.

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<sup>1</sup> Recommended International Code of Practice: General Principles of Food Hygiene (CAC/RCP 1-1969, Rev. 3-1997, Amended 1999)

<sup>2</sup> Specifications for microbiological monitoring of the outcome of SSOPs are not regarded as performance parameters for process control

<sup>3</sup> Proposed Draft Code of Hygienic Practice for Fresh Meat (CX/MPH 3/4)

<sup>4</sup> Proposed Draft Code of Hygienic Practice for Fresh Meat (CX/MPH 3/4) defines a performance parameter as “An expression of the required level of hazard control at a specified step that is considered necessary to achieve the appropriate level of protection”

<sup>5</sup> Principles for the Establishment and Application of Microbiological Criteria for Foods. CAC/GL 21-1997

### **3. General principles for microbiological monitoring of meat**

- i. Microbiological monitoring for process control purposes should only be implemented where meaningful in terms of consumer protection.
- ii. Microbiological monitoring should be based on scientific analysis and advice, and, where sufficient data are available, on microbiological performance criteria developed from risk analysis. The stringency of microbiological performance criteria should be proportional to risk.
- iii. Establishment of microbiological performance criteria should take into account all information available throughout the food chain, including the health status of animals at the production level.
- iv. Microbiological monitoring should be product specific, and should be applied only at those points in the food chain specified.
- v. Microbiological monitoring should be reasonably achievable.
- vi. Establishment of microbiological performance criteria is the responsibility of competent authorities, in consultation with relevant interested parties, and may consist of guidelines or mandatory regulatory standards.
- vii. Microbiological performance criteria that are established for the purposes of statistical process control should be based on micro-organisms that are indicative in the food specified of the presence of hazards to human health.
- viii. Microbiological performance criteria that are established as regulatory standards should monitor specific hazards.
- ix. The competent authority should verify compliance with microbiological performance criteria that are regulatory guidelines or standards e.g., microbiological statistical process control requirements, standards for *Salmonella* spp.

### **4. Guidelines for the implementation of microbiological monitoring for process control of meat**

#### **4.1. Types of microbiological performance criteria**

6. Microbiological performance criteria can take the form of regulatory requirements. Guidelines that indicate the hygienic adequacy of process control implemented by the establishment will most likely be formulated in terms of indicator microorganisms. Regulatory requirements should specify mandatory levels of control of particular hazards.

#### **4.2. Development of microbiological performance criteria**

7. Where possible, microbiological performance criteria should objectively express the level of hazard control as derived from the application of risk analysis principles. This entails knowledge of the level of control of hazards that is attained in the meat relative to the appropriate level of consumer protection (ALOP).

8. In the absence of sufficient knowledge of risks to human health, microbiological performance criteria can initially be established from baseline surveys of current industry performance, and can subsequently be modified as appropriate to reflect public health goals. Sampling plans for baseline surveys should be representative of the slaughter population, and cater for known biological variation in respect of hazards in the raw material supply e.g. influence of geographical region, farming type and season.

9. A microbiological performance parameter can be established at any step in the food chain, provided that there is an established link between the required level of control of hazards at that step and the ALOP. For the purposes of the CCMH, a performance parameter is defined as “an expression of the required level of hazard control at a specified step that is considered necessary to achieve the appropriate level of protection”.

10. Microbiological performance criteria for meat are unlikely to be of a nature that they can be verified on an on-going basis as part of a HACCP plan. In most situations, process criteria that are validated as achieving microbiological performance criteria at a particular step in the food chain will be used. These process criteria

should be measurable in real time, and will most likely constitute critical limits at critical control points in HACCP plans.

11. For the purposes of the CCMH, a food safety objective (FSO) is defined as “a performance parameter at the point of consumption”. It is unlikely that microbiological FSOs will be established that are subject to verification as part of a risk-based meat hygiene programme. However, microbiological performance (and process) criteria that meet the FSO can be established at other steps in the food chain.

#### **4.3. Specification of microbiological performance criteria**

12. A microbiological performance parameter should be specified in terms of type of microorganism, product and process being monitored, monitoring methodology, and response to non-compliance. Microbiological limits should take account the likelihood of uneven distribution of microorganisms in the sampled unit and the inherent variability of the analytical procedure.

13. In the case of indicator microorganisms e.g. generic *Escherichia coli*, Enterobacteriaceae and total viable counts (aerobic plate counts), the detection rate should generally be reflective of the level of process control. In the case of specific hazards (e.g. *Salmonella* spp.) and appropriate process control, the detection rate will generally be reflective of hazards arising pre-slaughter. In the latter case, there is limited availability of valid HACCP parameters that are relevant to on-line control of the level of contamination with specific pathogens.

14. A standardised random sampling plan should be developed, including specification of the process step, size and type of sample, collection methods and transport. Sampling may take place at single or multiple steps in the food chain e.g. carcasses on the slaughter floor, carcasses post-chill, meat cuts or trim at packing. Use of multiple steps in the food chain may provide greater information on process control and allows for a more targeted response to non-compliance by the establishment and the competent authority.

15. Sampling of tissue may be destructive e.g. by excision, or non-destructive e.g. by swabbing or sponging. As only a proportion of the total flora present will be removed by non-destructive sampling, performance criteria specified in this manner should be established in relation to destructive sampling. Pooling of samples provides reductions in cost but has some disadvantages in terms of knowledge obtained from monitoring.

16. The competent authority should provide flexibility in regulation so that the most effective monitoring systems can be established at the establishment level e.g. provision for alternative carcass sampling sites if an establishment can identify that they are likely to bear the same or more contamination than those specified.

17. Alternative monitoring parameters to microbiological testing that are properly validated e.g. serological testing of meat juice, should be established where they offer practical advantages.

#### **4.4. Frequency of monitoring**

18. There is no single method for determining the frequency of sampling. Frequency may be “process-based” or “throughput-based”, and low-throughput establishments may require special consideration in terms of sample numbers. In addition to ensuring randomness, variables to be taken into account at the establishment level include: source of raw materials, type and nature of the meat process, and volume of production.

19. Sampling frequency may be modified according to performance. Once a particular level of process control has been established according to standardised criteria, the frequency of subsequent microbiological monitoring may be decreased.

#### **4.5. Laboratory analysis**

20. Methods for detection and enumeration should be practical and effective. Only methods for which the reliability has been established (accuracy, reproducibility, inter-laboratory variation) should be used. Inter-laboratory testing should be a feature of a microbiological monitoring programme. New rapid methods may assist microbiological monitoring for indicator organisms e.g. fluorescence spectroscopic methods for detecting faecal material may provide the trigger for subsequent on-line microbiological sampling.

#### **4.6. Microbiological food safety outcomes**

21. Required regulatory outcomes for microbiological monitoring may be specified in several ways. For indicator organisms, two or three class attribute sampling plans that specify cut-offs for numbers of microorganisms (m and M) are useful. Where microbiological performance criteria are set according to current industry performance, percentile values may be used e.g. 80<sup>th</sup> percentile for m and 98<sup>th</sup> percentile for M. A variety of statistical approaches can be used e.g. “moving windows”, or sampling of specific lots.

22. Analysis and interpretation of results should be subject to regulatory specification. Effective systems should be in place for feedback of monitoring information from the establishment to all interested parties, so as to maintain and improve process control of meat.

23. The competent authority should regularly analyse results at both the establishment and national level, and provide appropriate feedback to establishments and other interested parties.

24. Additional to monitoring of process control, the results of microbiological monitoring may be used to establish on-farm regulatory controls e.g. intensive measures to reduce the prevalence of *Salmonella* spp. in fattening pigs.

#### **4.7. Regulatory action**

25. In situations of non-compliance with microbiological performance criteria, regulatory actions should be specified. Regulatory responses should be graded according to different microbiological outcomes as well as the public health impact of specific pathogens. Where detailed information on the health status of slaughtered animals is available from the place of production e.g. in the case of *Salmonella* spp. in fattening pigs and broiler chickens in some intensive production systems, regulatory responses in relation to process control may include consideration of pre-slaughter levels of hazards.

26. The competent authority should consider microbiological results in conjunction with all other information when taking regulatory action. Regulatory intervention and/or sanctions will be necessary when the establishment consistently fails to meet process control requirements.

27. In cases of repeated non-compliance and in addition to other actions, the competent authority may specify an increased sampling frequency until the required level of process control is restored.