



## JOINT FAO/WHO FOOD STANDARDS PROGRAMME

### CODEX COMMITTEE ON FOOD HYGIENE

#### Forty-seventh Session

Boston, Massachusetts, United States of America, 9 – 13 November 2015

### PROPOSED DRAFT GUIDELINES FOR THE CONTROL OF NONTYPHOIDAL *SALMONELLA* SPP. IN BEEF AND PORK MEAT

Comments of Argentina, Brazil, Canada, Colombia, Ecuador, Japan, Kenya, Niger, African Union and IAEA

#### ARGENTINA

Argentine cannot submit any comments until the final report of "FAO/WHO experts meeting to review the technical basis of the mitigation/intervention measures is available, which should be sent with time enough to be analyzed for our experts.

#### BRAZIL

Additional comments may be provided after the Report of Expert Consultation is released.

#### CONTROL MEASURES BEEF

##### Step 5: Stunning

##### 9.3.1 GHP-based control measures

##### Include:

The cattle entering the stunning box should be cleaned to reduce the initial load of microorganisms.

##### Step 24: Mechanical Tenderization

Include a paragraph with a step definition

#### CONTROL MEASURES FOR PORK

##### Step 5: Stunning

This is the point where the pig is rendered unconscious. This is the point where the animal is rendered unconscious. ~~No control measures, relevant for the reduction of *Salmonella*, has been identified at this step~~  
This can result in a shedding reflex and become a cross-contamination point due to animal contact with the ground after stunning.

##### GHP-based control measures

Keep the stunning sites clean.

##### Step 6: Sticking/Bleeding

25. This is the point in the process where the animal is bled. Regardless of the slaughter method, it is important for the establishment to minimize contamination of the carcass during any cut made at this step, avoiding any contamination by opening ~~where the pig is rendered unconscious.~~

##### Step 11: Polishing

##### 9.9.1 GHP-based control measures

42. Before passing the carcasses on to the clean area (bunging) or to a pre-evisceration rinse or spray, a measure should be in place to prevent visibly contaminated carcasses from being passed on. ~~If steam or hot water vacuuming is not available, knife trimming can be used to remove fecal contamination and other dressing defects. Steam or hot water vacuuming is acceptable to remove fecal contamination~~

## **CANADA**

### **General Comments**

Canada would like to thank members of the eWG for the work done on this document. The document is thorough and generally has good flow. We observe that some general guidance elements applying to both beef and pork have been merged but that a distinction was kept with regards to the process flow of beef and pork. We find this format is clear and avoids confusion.

Generally, we find the style of language varies throughout the document depending on sections. Specific comments were made below in an attempt to harmonize the wording of the advice provided throughout the document.

### **Specific comments**

#### **Appendix I Section 13.1 Paragraph 50**

Monitoring information should be made available to relevant stakeholders in a timely manner (eg, to producers, processing industry, ~~consumers~~).

**Rationale:** we propose the word “consumer” is removed from the example. Because it can be perceived that consumers may misinterpret complex monitoring information, including microbiological test results and view positive results for pathogens for example as the absence or lack of control by industry. If this is sought after outcome, information would need to be presented in a very simple way highlighting that action is taken right after any positive findings.

#### **Annex I Section 9, Paragraph 11, point f**

Personnel should be trained both on operations and food safety aspects of slaughtering. **The** line speed should leave adequate time to perform all processes steps in the operations.

**Rationale:** Add a period after the word “slaughtering” and separate the following into a new sentence for ease of reading.

#### **Section 9.2.1 Paragraph 21**

Applying a bacteriophage treatment to incoming cattle and allowing the bacteriophage appropriate contact time can reduce the bacterial load present on the animal prior to slaughter.

#### **Section 9.2.2 Paragraph 24**

It was suggested to add the use of bromine wash as an example for cattle wash as it is in use in Canada and the US. Adding text and or examples around the use of hot water or recycled hot water is also suggested as this is a decontamination treatment that is accepted by the EFSA.

#### **Section 9.2.2 Paragraph 26**

Washes containing either organic acids or other chemicals may be effective to reduce Salmonella. Some studies have shown that the levels on hides ~~compared to water washes~~ were reduced by 0.57 to 2.75 log<sub>10</sub> CFU/cm<sup>2</sup> **on intervention carcasses as compared with those treated with water washes** (Mies et al., 2004; Carlson et al., 2008; Jadeja and Hung, 2014).

**Rationale:** We are not clear what is meant in the original sentence. Are the reduction noted above the results of the treatments on hide by themselves or are they intended to express additional reductions observed relative to a water wash treatment only? Rewording of this area could provide some clarity.

#### **Section 9.4 STEP6**

Sticking/bleeding procedures used for traditional slaughter practices such as halal or kosher are not discussed in this document it was suggested these are added as they can differ from current commercial practices.

**Rationale:** This suggestion is made to encompass other practices used/requested by a certain proportion of the population.

#### **Section 9.4.1 Paragraph 33, point b**

~~Decontamination,~~ **A** mechanical process like scraping the hide surface to remove physical contamination, can be utilized.

**Rationale:** This sentence can be confusing. To enhance ease of reading, we propose to remove the word decontamination as the expression “remove physical contamination” found later in the sentence seems to achieve the same intent.

#### **Section 9.5.1 Paragraph 35**

Animals should be shackled, hung or placed in the bleeding area in such a way that contact between stick wounds and external surfaces of this or other animals (eg, hide/hooves) is avoided.

**Rationale:** Add a coma and a space after “eg.”.

#### **Section 9.8.2 Paragraph 55**

A significant reduction in Salmonella prevalence, from 8.3% to 0.8% prevalence, was found in ~~intervention~~ carcasses **where bung bagging was conducted prior to the pre-evisceration wash as** compared to those ~~where no bung bagging was conducted before the pre-evisceration wash~~ **carcasses that underwent the typical process where bung bagging is done following the wash** (Stopforth et al., 2006).

**Rationale:** We propose to reword the sentence to clarify the message that is communicated.

#### **Section 9.6.2 Paragraph 43**

It is suggested that the efficacy of using of hot potable recycled water is discussed as decontamination efficacy are have been found to be not significantly different, in terms of microbial reductions achievable on carcasses, between hot potable and hot recycled water.

**Rationale:** this is an additional option for processors to help decontaminate beef carcasses, which takes into account the economical aspect of their operations, without diminishing the efficacy of treatment.

#### **Section 9.10.1 Paragraph 58**

Preventative actions to avoid contamination and cross-contamination of the beef carcass are discussed however, there is no advice provided for instances where contamination would have occurred. In this specific area for example it is suggested that if contamination with ingesta occurs there should be advice on measures on actions to take if such an event were to take place.

#### **Section 9.14 Paragraph 70**

**Implementation of** temperature control and sanitation procedures (e.g. ~~define and monitor refrigeration parameters for refrigeration should be defined and monitored~~ so that carcasses reach a temperature that will prevent the growth of *Salmonella*).

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### **Section 9.15.1 Paragraph 74**

~~Ensure a reasonable flow of products, to~~ **In order to** reduce time out of chilling room, **a reasonable flow of product should be maintained.**

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### **Paragraph 75**

~~Clean and disinfect~~ **knives**, saws, slicers, and other food contact surfaces **should be cleaned and disinfected** as frequently as necessary to prevent the creation of unsanitary conditions.

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### **Paragraph 76**

~~Prevent~~ **Cross-contamination** from slaughter operations **should be prevented** by maintaining adequate airflow.

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### **Section 9.16.1 Paragraph 82**

If equipment is used to process meat of a different risk profile (eg, adult beef vs. veal) the equipment should be cleaned when changing from higher risk product to lower risk products. Alternatively lower risk product should be processed first.

**Rationale:** Add a coma following “eg,” for consistency with the rest of the document.

#### **Section 9.17.1 Paragraph 85**

Storage room ~~temperature~~ should be maintained at temperatures that will prevent the growth of Salmonella.

**Rationale:** We suggest removing the word “temperature” in the first instance it is used to avoid repetition within the sentence.

#### Paragraph 86

~~Monitor and document~~ Temperature of storage room and meat **should be monitored and documented.**

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### Section 9.17.2 Paragraph 89

Natural extracts, including various spice (oregano, lemon grass, garlic, turmeric, cinnamon, mustard), fruit (pomegranate, grape seed, cranberry), or other plant extracts (roselle, pine bark, Artemisia absinthium, Salvia officinalis and Schinus molle) were found to reduce Salmonella contamination in beef products...

**Rationale:** Close the parentheses following Schinus molle.

#### Paragraph 90

Lactobacillus spp. were found to decrease Salmonella contamination on beef products (Gomólka-Pawlicka and Uradzinski, 2003; Smith et al., 2005; Hoyle et al., 2009; Ruby and Ingham, 2009; Olaoye and Onilude, 2010; Chaillou et al., 2014).

**Rationale:** Open the parentheses prior to the references.

#### Paragraph 93

Treatment with nisin, a polypeptide, **in conjugation with lactate** resulted in a 0.4 log<sub>10</sub> [units?] reduction ~~in conjugation with lactate~~ (Cutter and Siragusa, 1995).

**Rationale:** We suggest to re-work the sentence to enhance flow of information, we also suggest to include information on the units related to the log reduction mentioned in the sentence for accuracy.

#### Paragraph 94

A mixture of volatile compounds resulted in a 1.7-2.2 log<sub>10</sub> [units?] reduction of Salmonella in ground beef during a 5 day storage period at 8 °C (Faith et al., 2015).

**Rationale:** we suggest including information on the units related to the log reduction mentioned in the sentence for accuracy.

#### Paragraph 95

Treatment with ε-polylysine reduced Salmonella levels by 1.5-2.4 logs [base log and units?] in fresh beef over 7 days depending on the storage conditions (Miya et al., 2014).

**Rationale:** we suggest including the information on the log-base and units related to the log reduction mentioned in the sentence for accuracy.

#### Section 10.5.1

#### Paragraph 106

~~Adequate maintenance and adjustment of~~ The equipment used for this operation **should be adequately maintained and adjusted.**

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### Paragraph 107

Regular cleaning of equipment, the environment and adherence to good personal hygiene practices by Employees **should be done** to avoid cross-contamination and avoid build up.

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### Section 10.6.1 Paragraph 111

~~Monitor and document~~ The temperature of storage room and meat **should be monitored and documented.**

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

#### Paragraph 112

~~Prevent cross~~ Cross-contamination from or to other food items **should be prevented.**

**Rationale:** The style of language varies as noted in general comments. We propose the changes above to reflect the language used in the rest of the document.

## Annex II

### Section 7.1

#### Paragraph 4

The basic steps in the slaughter process are to a large extent common for processing pigs skin-on, but they may be carried out differently in different slaughterhouses or countries. Therefore the necessity to use supplementary mitigation steps will also vary among individual slaughterhouses and countries. The use of supplementary mitigation steps will depend on the food safety targets set, for example, by the competent authorities or customers (eg, retail chains) and will be influenced by a range of factors, ~~eg,~~ **for example** animal feed, hygienic slaughter procedures, age of livestock, farming practices, size of establishment, equipment, automation, slaughter line speed, and the initial Salmonella load from incoming animals (~~for example,~~ **eg,** seasonal variation).

**Rationale:** Add a coma after “eg,”. Change “eg,” to “for example” as it is used a number of times within the paragraph.

### Section 8.2 box

Transport ~~to Slaughter~~

**Rationale:** Remove the last part of the box to be consistent with the rest of the document.

## Section 9

### Paragraph 12, point g

~~Maintain p~~ Proper employee hygiene practices **should be maintained** to prevent the creation of unsanitary conditions (eg, touching product with soiled hands, tools, or garments). Personal hygiene should include ~~the regular~~ washing of hands to prevent cross-contamination.

**Rationale:** We propose the changes above to reflect the language used in the rest of the document. Additionally we thing hands should be washed regularly.

### Section 9.2

#### Paragraph 18

This is the point where the pigs are held before slaughter. There is an increased potential for contamination with Salmonella during this time because of their presence in pig’s feces. Additionally, interaction with other pigs may cause stress and increased shedding of pathogens. ▫

**Rationale:** Suggest removing the second period after the sentence.

#### Paragraph 20

In addition limiting the time ~~animals spent~~ **spend in lairage at this point to up to 6 hr to a maximum of 6 hours** can reduce the risk of cross contamination~~▫~~ (Arguello et al., 2012).

**Rationale:** We suggest the changes noted above for clarity. Additionally, we suggest removing the period in front of the reference to keep only the one following it.

#### Paragraph 21

Care should be taken to control pest animals (eg, birds and rodents) in the lairage areas in order to reduce the cross-contamination by these animal vectors.

**Rationale:** Add a coma following “eg,” to harmonize with the rest of the document.

#### Paragraph 22

~~Ensure that pigs are-~~ **Pigs should be** dry enough to prevent dripping at the time of stunning.

**Rationale:** The changes noted above are to reflect the language used in other parts of the document.

## Section 9.3

### Paragraph 24

~~This is the point where the pig is rendered unconscious.~~ This is the point where the animal is rendered unconscious. No control measures, relevant for the reduction of Salmonella, has been identified at this step.

**Rationale:** We suggest removing the repetition in the paragraph.

## Section 9.4

### Paragraph 25

This is the point in the process where the animal is bled. Regardless of the slaughter method, it is important for the establishment to minimize contamination of the carcass during any cut made at this step, avoiding any contamination by ~~opening where~~ **opening the pig is rendered unconscious.**

**Rationale:** We suggest changes to make the text consistent with what is written in annex I.

### Section 9.4.1

#### Paragraph 26

Measures should be taken to avoid cross-contamination; sanitation of the processing environment should be maintained and ~~limit~~ carcass contact with the floor while being transferred to the line **should be limited.** (Bolton et al., 2002a).

**Rationale:** The changes noted above are to reflect the language used in other parts of the document. Remove the period at the end of the sentence and retain the period following the reference.

### Section 9.5.1

#### Paragraph 29, point a

~~Maintain~~ Sanitary conditions **should be maintained.** ~~Ensure that~~ The scalding tank **should be** is easy to clean and **should be kept** in good condition and repair. ~~Drain and clean~~ The scalding tank **should be drained and cleaned** at least once a day. ~~Pay~~ Particular attention **should be given** to seams weld sites and rough, scratched areas in the interior of the tank to ensure adequate cleaning.

**Rationale:** The changes noted above are to reflect the language used in other parts of the document.

#### Paragraph 29, point b

~~To maintain sanitary conditions, remove or prevent~~ Accumulations of hair and protein **in the scalding tank should be prevented where possible and should be removed from the scalding tank** before and during operations **as needed to maintain sanitary conditions.** ~~and control~~ Condensation **should also be controlled** as needed. Recirculation of water may result in greater accumulation of hair and residue and affect the control of temperature fluctuations.

**Rationale:** The changes noted above are to reflect the language used in other parts of the document.

#### Paragraph 29, point c

~~Maintain~~ A clean supply of water **should be maintained.** Re-use of the scalding tank water in multiple processing batches was associated with a higher Salmonella prevalence on carcass swabs (Tadee et al., 2014). ~~Change~~ The scald water **should be changed** at least once a day to prevent organic load build up. Adding an anti-foaming agent to the scald water reduces organic load build up in the form of foam (FAO Corporate Document Repository: Guidelines for slaughtering, meat cutting and further processing). ~~Use~~ **Where possible** ~~counter-current~~ **countercurrent** water flow (fresh or recirculated scald water that flows into the scalding tank in an opposite direction from that of the carcasses) **should be used** to increase heating efficiency and water cleanliness.

**Rationale:** Changes suggested above reflect the language used in other parts of the document.

#### Paragraph 29, point d

Vertical scalding using steam may improve the bacteriological quality of the meat and prevent bacterial contamination of lungs (Gracey, 1992). A vertical steam scald at 100 °C (212°F) allows for a constant supply of clean steam and prevents the accumulation of organic load as opposed to a water system.

**Rationale:** Added a comma between the author's name and year in the reference to reflect the format used throughout the document.

## Section 9.6

### Paragraph 31

Salmonella has been detected in air samples at the locations of dehairing and evisceration operations (Pearce et al., 2006).

**Rationale:** Added a period and a comma following the author's name in the reference to reflect the format used in the rest of the document.

### Section 9.6.1

#### Paragraph 32

~~To maintain sanitary conditions, remove or prevent~~ Accumulation of hair in the dehairing equipment **should be prevented and removed** as necessary **to maintain sanitary conditions**.

Rationale: Changes suggested above reflect the language used in other parts of the document.

### Paragraph 33

At the end of the shift, ~~remove~~ all organic material and debris **should be removed** from de-hairing equipment. ~~Consider~~—The importance of mechanical action and cleaning **should be taken into consideration**. Chemical cleaners and disinfectants should be selected based on several factors including but not limited to the soil type, equipment materials and water hardness.

Rationale: Changes suggested above reflect the language used in other parts of the document.

### Section 9.6.2

#### Paragraph 34

Special care should be taken to prevent recontamination and increases in bacterial

load when using a dehairing machine (Morgan et al., 1987; Gill and Bryant, 1993; Davies et al., 1999; Yu et al., 1999; FRPERC, 2007). Following preventive measures can be considered:

Rationale: punctuation has been added to reflect the format used in other parts of the document.

#### Paragraph 34, point a

~~Use~~ **Using** water between 60 °C to 62 °C (140°F to 144°F ) in the dehairing machine if the water is not chemically treated (ICMSF, 1998) or equivalent processes.

Rationale: Change suggested in order to harmonize the text with the language used in other parts of the document. Punctuation has been added to reflect the format used in other parts of the document.

#### Paragraph 34, point b

If possible, prior to dehairing, ~~evaluate~~ methods to prevent fecal voiding **should be evaluated** (Bolton et al., 2002b). ~~Have in place~~ Procedures to clean contaminated carcasses that void fecal material after dehairing and prior to gambrelling and rehainging **should be in place**.

Rationale: Changes suggested above reflect the language used in other parts of the document.

### Section 9.7.1

#### Paragraph 36

~~Minimize~~ Carcass contamination **should be minimized** by cleaning and disinfecting gambrel table when needed to remove fecal materials before processing is resumed.

### Section 9.8

#### Paragraph 37

This is the point in the process where the carcass **surface** is subjected to direct-fire bursts ~~on the animal surface~~ in order to improve the hair removal and reduce or eliminate the pathogens of skin surface. This is an important step in the **control of Salmonella control**.

Rationale: Suggestions were made to help enhance readability and flow.

### Section 9.9.1

#### Paragraph 41

Polishing is a primary mode of pork carcass recontamination following reductions achieved during singeing (James et al., 2007; Bolton et al., 2002a; Snijders et al., 1984; Hald et al., 2003).

Rationale: Closing parentheses at the end of the references.

### Section 9.9.2

#### Paragraph 44

An additional singeing step, after polishing, may be added to reduce contamination introduced by polishing (Spescha et al., 2006; Delhalle et al., 2008). **Consideration should be given as to** whether carcasses have been adequately reconditioned in a sanitary manner, if contaminated feces voided during the gambrelling step.

Rationale: Changes suggested above reflect the language used in other parts of the document.

### Section 9.12.1

**Paragraph 58**

To prevent contamination of the carcass or viscera, ~~tie~~ the rectum **should be tied** before evisceration. ~~Remove~~ The pluck **should be removed along** with the esophagus and viscera attached (so there is no leakage).

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 59**

~~If possible, avoid~~ Cutting through tonsils **should be avoided**, ~~due to~~ **because of** the risk of spreading Salmonella from tonsil tissue.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 61**

When removing stomach and intestines, ~~be sure to leave~~ a minimum of 2 cm of esophagus **should be left** on the stomach to minimize leakage of stomach contents.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 62**

~~Avoid~~ Cutting or rupturing of the gut **should be avoided**. The critical operations are: cutting around the rectum, removal of the intestinal tract, and removal of the pluck **set**.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 63**

~~Remove~~ Carcasses with visual contamination **should be removed from the line and sent** for reconditioning (knife trimming or steam vacuuming) before carcass splitting.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Section 9.13.1****Paragraph 65**

~~Take~~ Care **should be taken** to avoid cross-contamination, which may occur when carcass splitting saw blades come in contact with the throat.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 66**

~~Clean and disinfect~~ Carcass splitting equipment **should be cleaned and disinfected** during and after each carcass or as appropriate (van Hoek et al., 2012; Smid et al., 2013; Smid et al., 2014).

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 67**

When using two blade axe systems, ~~control~~ contamination ~~building up~~ **build-up** between blades **should be controlled** by regular cleaning and disinfection with hot water. **Cross-contamination should be avoided by** allowing adequate distance between carcasses (ie, avoid carcass-to-carcass contact) and walls and equipment.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Section 9.14.1****Paragraph 69**

~~Flush the oral cavity removing~~ The ingesta, bile, or other contaminants **should be removed by flushing the oral cavity** before head dropping and head inspection.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 70**

~~Clean and disinfect~~ Knives and head dropping equipment **should be cleaned and disinfected** between carcasses and whenever sectioning of the esophagus occurs.

Rationale: Changes suggested above reflect the language used in other parts of the document.

**Paragraph 71**

**Personnel should be** Be aware of potential contamination of the head, neck, and carcass by knives or equipment after incision of the oral-pharyngeal cavity or from exposure to fresh stomach contents when dropping heads and processing of head and cheek meat.

Rationale: Changes suggested above reflect the language used in other parts of the document.

#### **Section 9.14.2**

##### **Paragraph 74**

It is suggested that recycled hot water is discussed as a possible carcass treatment that may be considered.

Rationale: the addition of such an example would reflect practices that have been reviewed and accepted in some parts of the world.

##### **Paragraph 74, point a**

- a. **Cleaning** the contaminated carcasses by removing visible contamination by trimming, steam or hotwater vacuuming prior to final inspection and final rinse.

Rationale: Changes suggested above reflect the language used in other parts of the document.

##### **Paragraph 74, point b**

- b. ~~Rinse~~ **Rinsing of** carcasses from the top down. ~~Minimize and minimizing~~ any splash onto other carcasses.

Rationale: Changes suggested above reflect the language used in other parts of the document.

#### **Section 9.16.1**

##### **Paragraph 79**

~~Ensure~~ **Ensuring** that carcasses are adequately spaced to allow for effective cooling.

Rationale: Changes suggested above reflect the language used in other parts of the document.

#### **Section 9.17.1**

##### **Paragraph 86**

~~Clean and disinfect~~ Knives, saws, slicers, and other food contact surfaces **should be cleaned and disinfected** as frequently as necessary (ie, ideally between each carcass) to prevent the creation of unsanitary conditions.

Rationale: Changes suggested above reflect the language used in other parts of the document.

##### **Paragraph 87**

~~Maintain~~ Fabrication area and equipment **should be maintained** in a sanitary condition.

Rationale: Changes suggested above reflect the language used in other parts of the document.

##### **Paragraph 88**

~~Clean and disinfect~~ Conveyor belts **should be cleaned and disinfected** frequently.

Rationale: Changes suggested above reflect the language used in other parts of the document.

##### **Paragraph 89**

~~Prevent~~ Cross-contamination from slaughter operations **should be prevented** by maintaining adequate airflow.

Rationale: Changes suggested above reflect the language used in other parts of the document.

#### **Section 9.19.1**

##### **Paragraph 96**

~~Monitor and document~~ Temperatures of storage room and meat **should be monitored and documented**.

Rationale: Changes suggested above reflect the language used in other parts of the document.

#### **Section 10.1.1**

##### **Paragraph 101**

~~Monitor and document~~ Temperatures of vehicle and meat **should be monitored and documented**. Meat should be chilled before loading onto the vehicle for transport.

Rationale: Changes suggested above reflect the language used in other parts of the document.

### Section 10.3.1

#### Paragraph 104

~~Monitor and document~~ Temperatures of storage room and meat **should be monitored and documented.**

Rationale: Changes suggested above reflect the language used in other parts of the document.

#### Paragraph 105

~~Prevent~~ Cross-contamination from or to other food items **should be prevented.**

Rationale: Changes suggested above reflect the language used in other parts of the document.

### Section 10.4.1

#### Paragraph 113

Consumers should be given advice on the proper manner to handle pork meat, including leftovers, once cooked.

Rationale: Cross-contamination from other foods can occur and compromise food safety.

## COLOMBIA

Colombia is pleased to submit the following comments to the document "**draft guidelines for the control of nontyphoidal *Salmonella* spp. in beef and pork meat**" in step 3 of the procedure, submitted by the secretariat of the Codex Alimentarius Commission.

We reference the Spanish version of document CX/FH 15/47/5.

### I. GENERAL COMMENTS

Colombia expresses its concern regards the "advancement" of the draft guidelines, since as yet there is no expert report for the country to analyze and which would guide a more detailed examination of the document.

Proposal: Not to follow the Accelerated Procedure (5/8).

### II. ANNEX I; SECTION 9.2.1.

We would recommend evaluating the inclusion of the use of bacteriophages prior to the slaughter of the animal, since there may be recontamination. This is because in order for their use to be effective, the bacteriophages' contact time may be extended.

*"21. Applying a bacteriophage treatment to incoming cattle and allowing the bacteriophage appropriate contact time can reduce the bacterial load present on the animal prior to slaughter."*

Proposal: Evaluate its inclusion.

### II. ANNEX I; SECTION 9.14.

We recommend the inclusion of the step of general washing of the carcasses, including GHP and hazard-based control measures. This is because any blood residue must be eliminated before chilling.

*"STEP 16:" CHILLING*

Proposal: At the point in the process between post mortem inspection and chilling, include a step called "*washing of the carcasses*"

## ECUADOR

### (i) Specific observations:

Ecuador agrees to the creation of a common section and two specific sections (beef and pork meat).

Requests that in the process flow diagrams the following changes be made: From primary production to consumption - beef and pork meat the term "Lairage" be replaced by " **Holding area** ".

*Grounds:* The term lairage is used in livestock breeding at a specific time of the animal's life, and therefore is not applicable when the animal is held in the enclosure the prior to slaughter.

The country feels that in the process flow diagrams: From production to consumption - Beef and Pork meat the term **Ante-mortem inspection** should be included after step 4.

*Grounds:* Ante-mortem inspection is a routine activity carried out in slaughterhouses in order to verify the sanitary conditions of the live animals kept in the slaughterhouse enclosures and the conditions of their slaughter for the purpose of producing a report on health conditions.

It is requested that in step 16 "removal of head" the terms **total or partial** be added.

In step 9 "Gambrelling", the country considers that this point should be examined since gambrel tables are not used in all countries, the animal is transferred throughout the process, on rails after stunning.

**(ii) General comments:**

The country is considering agreeing to and endorsing the document, taking into account the above-mentioned observations.

**JAPAN**

**General Comments**

Japan supports the current document. However, Japan proposes minor revisions for further refinement.

**Specific Comments**

**Appendix I**

**1. INTRODUCTION**

**Para 4**

In the context explaining Hazard-based, third sentence:

They have an effect on consumer protection, but the actual degree of protection is unknown. **The benefit of a hazard-based measure cannot be exactly determined without a specific risk assessment; however, any significant reduction in pathogen prevalence and / or concentration is expected to provide a certain level of human health benefit.**

*Rationale:*

The sentence should be in accordance with the GUIDELINES FOR THE CONTROL OF *CAMPYLOBACTER* AND *SALMONELLA* IN CHICKEN MEAT (CAC/GL 78-2011).

**11.1 Development of risk-based control measures**

**Para 26**

**When risk modelling tools are developed,** the risk manager needs to understand the capability and limitations of risk modelling tools.

*Rationale:*

There has not been available risk modelling tools yet.

**12.4.1. Industry**

**Para 40**

**2<sup>nd</sup> sentence:**

Verification should include observation of monitoring activities, documentary verification and sampling for *Salmonella* **and other microbiological** testing as appropriate.

*Rationale:*

Other indicator microorganisms may be used for verification purpose.

**Annex I (CONTROL MEASURES FOR BEEF)**

**Para 32, 38, 39, 61, 62**

...**can** include:

*Rationale:*

For consistency. (See para 49)

**9.1.1 GHP-based control measures**

**Para 15**

**2<sup>nd</sup> sentence in the section a**

Where the Salmonella status is known, this information should be communicated to the slaughter house before arrival/receiving. For example, **information prior to slaughter can** ~~food chain information in the form of electronic or paper records should~~ be applied to improve hygiene interventions at slaughter. ~~The availability of food chain information prior to slaughter would~~, **and may** allow food business operators, meat inspectors and risk managers to take steps to minimize cross-contamination during slaughter.

Rationale:

1. Definition of food chain information is unclear.
2. Information available in this step is thought to be information prior to the slaughter.

**Para 15**

**Section b**

If **information prior to slaughter** ~~food chain information~~ is available, herds with a high incidence of Salmonella can be segregated and processed at the end of the production day.

Rationale:

See rationale described in the Para 15, 2nd sentence in the section a.

**Para 15**

**Section c**

Consider **whether** other factors, ~~for example the age, type of cattle received (eg, veal calves), season (ie, high prevalence season) or geography, that~~ may contribute to the spread of Salmonella, represent a concern related to pathogen load and therefore whether adjustments to the food safety **management** system need to be made.

Rationale:

Editorial

**9.2.1 GHP-based control measures**

**Para 21**

Applying a bacteriophage treatment to incoming cattle and allowing the bacteriophage appropriate contact time can reduce the bacterial load present on the animal prior to slaughter. **The use of the bacteriophage may require approval by the competent authority, to permit their use.**

Rationale:

1. Bacteriophage treatment is not permitted in all member countries.
2. If the levels of efficacy on Salmonella reduction are documented in an article, this paragraph should be in the Hazard-based control measures.

**9.4.1 GHP-based control measures**

**Para 32**

32. Measures to prevent contamination of the carcass underlying the hide during the initial cut **can** include:

- ~~33~~ **a.** Using the smallest effective cut possible to accomplish bleeding.
- b** **a.** Using a validated one- or two-knife system including the hand and knife cleaning and knife disinfecting between sticking each carcass.
- c** **b.** It may be necessary to clean the carcass area prior to sticking. Decontamination, a mechanical process like scraping the hide surface to remove physical contamination, can be utilized.
- d** **e.** Be aware of mud-contamination moving downwards into the cut.

Rationale:

Editorial

**9.6.1 GHP-based control measures**

**Para39**

39. Measures to limit cross-contamination of carcasses during hide removal include:

- a. Employing shields/barriers (eg, legging papers) to prevent contamination and cross-contamination of

carcasses.

b. Severing or removing the switch on the tail when using hide pullers to minimize the possibility that contaminants become airborne from splattering or flapping of the hide.

c. ~~E~~**When** employing a mechanical hide puller-

~~E~~**ensuring** mechanical hide pullers pull the hide away from the carcass in a downward or backwards motion (ie, not upward), thereby reducing the potential for contamination to drip, splatter, or flap onto the carcass or employees handling de-hided carcasses.

Rationale:

Editorial

114. Consumers should be informed on the potential risk associated with finished beef product in order to follow instruction and make informed choices on how to avoid the spread and growth of Salmonella (e.g, storage and thawing temperature, hygiene and cooking temperature, hand washing, ). ~~This information should be provided by the local government, health agencies, manufacturers, retailers or other consumer sources. The WHO Five keys to safer food<sup>19</sup> assists in this process.~~

**The above information to consumers should be provided through multiple channels such as national media, health care professionals, food hygiene trainers, product labels, pamphlets, school curriculae and cooking demonstrations.**

115. Cooking of beef can reduce or eliminate the level of Salmonella.

116. Consumers should be appropriately informed of raw treated meat (eg, mechanically tenderized, minced meat) so they can take appropriate actions to make sure meat is properly cooked.

~~117. Consumer education should focus on handling, hand washing, cooking, storage, thawing, prevention of cross-contamination, and prevention of temperature abuse. The WHO Five keys to safer food<sup>19</sup> assists in this process.~~

118. Special attention should be paid to the education of all persons preparing food, and particularly to persons preparing food for the young, old, pregnant and immuno-compromised.

~~119. The above information to consumers should be provided through multiple channels such as national media, health care professionals, food hygiene trainers, product labels, pamphlets, school curriculae and cooking demonstrations.~~

Rationale:

Integrate with Para 117 and 119.

## **ANNEX II (CONTROL MEASURES FOR PORK)**

**Para 57,**

...~~can~~ include:

Rationale:

For consistency. ( see para 74)

### **9.1.1 GHP-based control measures**

**Para 16**

**2<sup>nd</sup> sentence in the section a**

Where the Salmonella status is known, this information should be communicated to the slaughter house before arrival/receiving. For example, **information prior to slaughter can** ~~food chain information in the form of electronic or paper records should be applied to improve hygiene interventions at slaughter. The availability of food chain information prior to slaughter would, and may~~ allow food business operators, meat inspectors and risk managers to take steps to minimize cross-contamination during slaughter.

Rationale:

1. Definition of food chain information is unclear.

2. Information available in this step is thought to be information prior to the slaughter.

### **9.2.1 GHP-based control measures**

**Para 24**

This is the point where the pig is rendered unconscious. ~~This is the point where the animal is rendered unconscious.~~ No control measures, relevant for the reduction of Salmonella, has been identified at this step.

Rationale:

Editorial

**9.6.1 GHP-based control measures**

**Para 33**

At the end of the shift, remove all organic material and debris from ~~de-hairing~~ **dehairing** equipment. Consider the importance of mechanical action and cleaning. Chemical cleaners and disinfectants should be selected based on several factors including but not limited to the soil type, equipment materials and water hardness.

Rationale:

Editorial

**Para 107**

107. Consumers should be informed on the potential risk associated with finished pork product in order to follow instruction and make informed choices on how to avoid the spread and growth of Salmonella (e.g, storage and thawing temperature, hygiene and cooking temperature, hand washing, ). ~~This information should be provided by the local government, health agencies, manufacturers, retailers or other consumer sources. The WHO Five keys to safer food<sup>19</sup> assists in this process.~~

**The above information to consumers should be provided through multiple channels such as national media, health care professionals, food hygiene trainers, product labels, pamphlets, school curriculae and cooking demonstrations.**

108. Cooking of pork can reduce or eliminate the level of Salmonella.

109. Consumers should be appropriately informed of raw treated meat (eg, mechanically tenderized, minced meat) so they can take appropriate actions to make sure meat is properly cooked.

~~110. Consumer education should focus on handling, hand washing, cooking, storage, thawing, prevention of cross contamination, and prevention of temperature abuse. The WHO Five keys to safer food<sup>22</sup> assists in this process.~~

111. Special attention should be paid to the education of all persons preparing food, and particularly to persons preparing food for the young, old, pregnant and immuno-compromised.

112. The above information to consumers should be provided through multiple channels such as national media, health care professionals, food hygiene trainers, product labels, pamphlets, school curriculae and cooking demonstrations.

Rationale:

Integrate with Para 110 and 112.

**KENYA**

**General comment**

Kenya appreciates the good work of the PWG and eWG chaired by the US and co-chaired by Denmark in drafting this draft codex standard. The structure of the document is satisfactory, concise and user friendly.

**1. INTRODUCTION**

4. The Guidelines build on general food hygiene provisions already established in the Codex system and propose potential control measures specific for *Salmonella* strains of public health relevance in beef and pork meat. In this context, the Codex Alimentarius Commission (CAC) is committed to develop standards that are based on sound science<sup>1</sup> **and risk based management**. Potential control measures for application at single or multiple steps of the food chain are presented in the following categories:

**Comment: We propose the addition of statement .... “And risk based management”... in clause 4.**

**Rationale: To be consistent with other codex standards and related texts**

**13.1 Monitoring**

48. Regulatory monitoring programmes should be designed in consultation with relevant stakeholders, taking into account the most cost-efficient resourcing option for collection and testing of samples. Given the importance of monitoring data for risk management activities, sampling and testing components should be standardized on a national basis. ~~and be subject to quality assurance.~~

**Comment:** We propose the deletion of text (~~and be subject to quality assurance.~~) on clause 48.

**Rationale:** The standard is part and parcel of quality assurance, no need to reemphasize.

### 13.2 Review

53. Information gained from monitoring in the food chain should be integrated with public health surveillance, food source attribution data, and withdrawal and recall data, where available to evaluate and review the effectiveness of control measures **from primary production to consumption.**

**Comments:** We propose the addition of “.from primary production to consumption.” on clause 53.

**Rationale:** For clarity.

### 13.3 Public health goals

55. Countries should consider the results of monitoring and review when reevaluating and updating public health goals for control of *Salmonella* in foods **and acceptable levels of protection**, and when evaluating progress. Monitoring of food chain information in combination with source attribution and human health surveillance data are important components<sup>15</sup>.

**Comment:** We propose the insertion of the statement .... ‘and acceptable levels of protection’... in clause 55.

**Rationale:** Public health goals are futuristic while acceptable protection levels are current. This will consequently conform to the world trade organization agreement on application of sanitary and phytosanitary measures.

## ANNEX I CONTROL MEASURES FOR BEEF (For Sections 7 to 10)

### 7.1. Generic flow diagram for application of control measures

4. The basic steps in the slaughter process are to a large extent common but they may be carried out differently in different slaughterhouses or countries. Therefore the necessity to use supplementary mitigation steps will also vary among individual slaughterhouses and countries. The use of supplementary mitigation steps will depend on the food safety targets set, for example, by the competent authorities or customers (eg, retail chains) and will be influenced by a range of factors, eg, animal feed, hygienic slaughter procedures, age of livestock, farming practices, size of establishment, equipment, automation, slaughter line speed, and the initial *Salmonella* load from incoming animals (for example, seasonal variation). A variety of interventions may be used to reduce contamination with *Salmonella* throughout processing. While the effect on *Salmonella* of the individual interventions can be variable, there is clear evidence that use of multiple interventions throughout processing as part of a ~~“multiple hurdle”~~ **“hurdle concept”** strategy will provide a more consistent reduction of *Salmonella*.

**Comment:** Kenya proposes to delete “multiple hurdle” and replace with “hurdle concept”.

**Rationale:** Multiple has appeared twice in same sentence. Hurdle concept has been used in some other codex texts.

#### Process Flow Diagram 1: Primary Production to Consumption – Beef

**Comment:** Insert “3bis Ante-mortem inspection” between cells 3 and 4.

**Rationale:** Ante-Mortem is an important step in the slaughter process (Refer section 6 of the Code of Hygienic Practice for Meat CAC/RCP 58-2005.)

#### Availability of Control Measures at Specific Steps in the Process Flow

**Comment:** Kenya proposes to insert “3bis Ante-Mortem inspection” between cells 3 and 4

**Rationale:** Ante-Mortem is important step in the slaughter process (Refer CAC/RCP 58-2005)

### 9.1.1 GHP-based control measures

15. When receiving the cattle the slaughterhouse should

d. Establishments should make determinations at receiving/holding about the overall cleanliness of cattle received and classify lots of cattle according to their level of cleanliness **and disease status**. Specific contamination or cross-contamination control measures can be taken by mud score classification. For example, establishments may decide to slow the line speed down to give employees more time to effectively dress the cattle with higher mud scores.

**Comment:** We propose the addition of "... and disease status." On clause 15d.

**Rationale:** the disease status is vital component of evaluation at this step.

### 9.2.2 Hazard-based control measures

24. Decontamination treatments have been shown to be effective in the reduction of pathogens including *Salmonella* on cattle hides. ~~Examples of decontamination treatments are listed below. These hide-on treatments can be used at this or a subsequent step until dehiding. Care should be taken to minimize cross-contamination especially after the hide has been opened at any time.~~

**Comment:** We propose deletion of the second statement in clause 24.

**Rationale:** The deleted phrase is a study citation. A home of this important information can be sought in a relevant FAO publication. A consequential clean up in other paragraphs.

### 9.7 Step 9: Head Removal/Head Washing

48. This is the point in the slaughter process where the head is removed from the carcass. It is important to maintain **sanitary hygienic** conditions because cross-contamination can occur if the head comes into contact with other carcasses or heads, equipment and employees.

**Comment:** We propose the replacement of the word sanitary with hygienic

**Rationale:** To be consistent with codex language. Observe consequential changes where necessary

## 10. CONTROL MEASURES FOR DISTRIBUTION CHANNELS (STEPS 20 TO 26)

### 10.7.1 GHP-based control measures

114. Consumers should be informed on the potential risk associated with finished beef product in order to follow instruction and make informed choices on how to avoid the spread and growth of *Salmonella* (eg, storage temperature, hygiene and cooking temperature). This information should be provided by the **competent regulatory authority** local government, health agencies, manufacturers, retailers or other consumer sources.

**Comment:** We propose the inclusion of a competent regulatory authority.

**Rationale:** Placement of regulatory authorities differ in each country depending on national legislation, structures and practice.

## ANNEX II CONTROL MEASURES FOR PORK (For Sections 7 to 10)

### Process Flow Diagram: Primary Production to Consumption –Pork

**Comment:** Kenya proposes to insert "3bis Ante-mortem inspection" between Cells 3 and 4

**Rationale:** Ante-mortem is an important step in the slaughter process (Refer: Section 6 of Code of Hygienic Practice of Meat: CAC/RCP 58-2005)

These process steps are generic and the order may be varied as appropriate. This flow diagram is for illustrative purposes only. For application of control measures in a specific country or an establishment, a complete and comprehensive flow diagram should be drawn up.

### Availability of Control Measures at Specific Steps in the Process Flow

**Comment:** Kenya proposes to insert "3bis Ante-mortem inspection" between process step 3 and 4

**Rationale:** Ante-mortem is an important step in the slaughter process (Refer: Section 6 of Code of Hygienic Practice of Meat: CAC/RCP 58-2005)

### 10.4.1 GHP-based control measures

107. Consumers should be informed on the potential risk associated with finished pork product in order to follow instruction and make informed choices on how to avoid the spread and growth of *Salmonella* (eg, storage temperature, hygiene and cooking temperature). This information should be provided by the local government **competent regulatory authorities**, health agencies, manufacturers, retailers or other consumer sources

**Comment:** Insert "competent regulatory authority," in clause 107.

**Rationale:** Placement of regulatory authorities differ in each country depending on national legislation, structures and practice.

## NIGER

### 3. SCOPE AND USE OF THE GUIDELINES

10. The primary focus is to provide information on practices that may be used to prevent, reduce or eliminate, nontyphoidal Salmonella in fresh beef and pork meat.

### 4. DEFINITIONS

You have define Meat

~~12.3.1 Industry~~ 12.3.1 Industry

12.3.1

36 ~~The industry and/or~~ the competent authority should provide guidelines and other implementation tools to industry as appropriate, for the development of the process control systems.

~~12.3.2 Regulatory systems~~ 12.3.2 Regulatory systems

~~12.4 Industry~~ 12.4 Industry

~~12.4.2 Regulatory systems~~ 12.4.2 Regulatory

### CONTROL MEASURES FOR BEEF (For Sections 7 to 10)

15. When receiving the cattle the slaughterhouse should

a. Consider any information provided by the farm or feedlot, on the production systems or feedlot controls for Salmonella. Effective farm and feedlot management and control can reduce fecal shedding of the organism, as well as reduce the microbial load on the animals, and in the intestinal tract.

Where the Salmonella status is known, this information should be communicated to the slaughter house before arrival/receiving cattle For example, food chain information in the form of electronic or paper records should be applied to improve hygiene interventions at slaughter. The availability of food chain information prior to slaughter would allow food business operators, meat inspectors and risk managers to take steps to minimize cross-contamination during slaughter.

#### 9.14.1 GHP-based control measures

69. Carcass chilling should begin within one hour of bleed-out. The chilling room should be kept at temperatures that will prevent the growth of Salmonella (Give the temperature and reference) 70. Implement temperature control and sanitation procedures (eg, define and monitor refrigeration parameters so that carcasses reach a temperature that will prevent the growth of Salmonella) Give the temperature and reference .

9.15.

73. These steps include cutting and deboning that can result in wholesale pieces. Maintain a cool processing room temperature to reduce the potential for Salmonella growth (Give the temperature and reference)

78. Give the temperature and reference

85. Give the temperature and reference

10.1.1

97. Give the temperature and reference

99. Give the temperature and reference

100 Give the humidity and reference

103 Give the temperature and reference

104 Give the temperature and reference

105 Give the temperature and reference

110. Give the temperature and reference

111. Monitor and ~~document~~ record temperature of storage room and meat

118. Special attention should be paid to the education of all persons preparing food, and particularly to ~~persons~~ those preparing food for the young, old, pregnant and immuno-compromised.

## PIG MEAT

103 [Give the temperature and reference](#)

104. Monitor and ~~document~~ [record](#) temperature of storage room and meat

**AFRICAN UNION****Issue:**

The Codex Committee on Food Hygiene (CCFH) will discuss the Proposed Draft Guidelines for the Control of Nontyphoidal *Salmonella* spp. in Beef and Pork Meat at Step 4.

**Issue & Rationale:**

All the scientific matters on safety, both regarding format and clarity have been considered, leaving none of these issues unresolved. Even though the OIE document has been referenced when the OIE final document is not yet ready, it is considered that OIE basically deals with animal health and the non-completion of the reference document should not contravene any of the food safety issues in the Proposed Draft Guidelines of the Control of Nontyphoidal *Salmonella* spp. in Beef and Pork Meat (CX/FH 15/47/5). The document is comprehensive and thoroughly addresses the key food safety issues associated with beef and pork. Most, if not all, of the control measures that are important for the control of nontyphoidal *Salmonella* spp. in beef and pork meat have been addressed. Hazard-based and GMP-based control measures have been well-articulated to ensure protection of public health and safety.

**A.U. Position:**

The AU supports adoption of the Proposed Draft Guidelines of the Control of Nontyphoidal *Salmonella* spp. in Beef and Pork Meat at Step 5/8.

**General Comment:**

The current format of three main sections (common section, control measures on beef and control measures on pork) makes the document user-friendly.

**IAEA****(i) General Comments**

None

**(ii) Specific Comments**

Specific comments relate to paragraph 88 and also to the inclusion of a scientific reference that includes important data related to the use of irradiation to control salmonella in beef and pork. These two specific comments are detailed below.

**Paragraph 88**

This paragraph does not accurately represent the requirements in Codex General Standard for Irradiated Foods and fails to mention the appropriate Codex code of practice. The following proposed amendment is suggested:

88. Various doses of **ionizing radiation** ~~Gamma rays or electron beams applied to warm, chilled, or frozen carcasses~~ have been shown to be effective at eliminating *Salmonella* **in warm, chilled or frozen beef or pork**. ~~Where irradiation is permitted, levels should be validated and approved by the competent authority (General Standard for Irradiated Foods (CODEX STAN 106-1983)).~~ **Application and control of the process should take into consideration the General Standard for Irradiated Foods (CODEX-STAN 106-1983) and the Recommended International Code of Practice for Radiation Processing of Foods (CAC/RCP 19-1979).**

**Rationale**

Delete "~~gamma rays and electron beams~~" and replace with "**ionizing radiation**" because x rays can also be used (in addition to gamma rays and electron beams) to eliminate *salmonella* and the term ionizing radiation covers all three forms of radiation permitted under the General Standard for Irradiated Foods (CODEX-STAN 106-1983).

Delete "~~applied to warm, chilled, or frozen carcasses~~" because the ionizing radiation can be applied to ground, minced or packaged foods not just whole carcasses.

Add "**in warm, chilled or frozen beef or pork**" at the end of the first sentence because it is important to point out that radiation is effective with beef or pork that is warm, chilled or frozen and this information would be lost in view of the deletion (directly above).

Delete “Where irradiation is permitted, levels should be validated and approved by the competent authority (General Standard for Irradiated Foods (CODEX STAN 106-1983)). and replace with “**Application and control of the process should take into consideration the General Standard for Irradiated Foods (CODEX-STAN 106-1983) and the Recommended International Code of Practice for Radiation Processing of Foods (CAC/RCP 19-1979).** This is necessary because these standards provide for the appropriate requirements for food irradiation and irradiated food and therefore it is not necessary to state that “Where irradiation is permitted, levels should be validated and approved by the competent authority”. For example:

(i) The scope of the General Standard for Irradiated Foods (CODEX-STAN 106-1983) relates to foods processed by ionizing radiation and used in conjunction with applicable hygienic codes, food standards and transportation codes.

(ii) The regulatory control of food irradiation should take into consideration the General Standard for Irradiated Foods (CODEX-STAN 106-1983) and the Recommended International Code of Practice for Radiation Processing of Foods (CAC/RCP 19-1979, Rev.1-2003).

(iii) the Codex Code of Practice for Radiation Processing of Food (CAC/RCP 19-1979) identifies the essential practices to be implemented to achieve effective radiation processing of food products in a manner that maintains quality and yields food products that are safe and suitable for consumption.

(iv) The purpose of the Codex Code of Practice (CAC/RCP 19-1979) is to provide principles for the processing of food products with ionizing radiation that are consistent with relevant Codex Standards and codes of hygienic practice.

#### **Section 14. Scientific References**

Please add the following scientific reference which has useful information related to the irradiation of pork and beef;

J Farkas, Irradiation as a method for decontaminating food: A review,. International Journal of Food Microbiology, 1998; 44 (3): 189–204

#### **Rationale**

This additional scientific reference has important information related to the irradiation of beef and pork, for example it indicates that the threshold dose for an organoleptically detectable “off-flavour” commences at approximately 2.5 kGy and 1.75 kGy for beef and pork respectively and provides irradiation D<sub>10</sub> data for several different *Salmonella* serotypes in pork and beef (as well as in others foods).