**DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES**
**DIRECTORATE OF VETERINARY PUBLIC HEALTH**

| **Notice No. VPN/52/2018** | **Date: 19.10.2018** |
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**Subject: Guidelines on the verification of compliance with process hygiene control and microbiological food safety performance objectives under the Meat Safety Act**

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**PART I**

**TERMS AND DEFINITIONS**

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| ***Authorised person*** | Means any person authorised to exercise or perform any power or duty by the National executive officer (NEO) |
| ***Carcass*** | Means the whole body of a slaughtered animal after dressing. |
| ***Composite sample*** | Means samples from separate sources which are pooled for testing purposes. |
| ***Establishment operator*** | Means a person in charge of an establishment who is accountable for the operations of the establishment and responsible for ensuring that the regulatory requirements are met. |
| ***Establishment*** | Means any building or area in which meat or food is handled and the surroundings under the control of the same management |
| ***Fresh meat*** | Means meat, including meat vacuum-wrapped or wrapped in a controlled atmosphere, which has not undergone any treatment other than cold treatment to ensure preservation. |
| ***Meat borne pathogen*** | Means a biological agent transmitted through meat, which is associated with illness or death. |
| ***Microbiological criteria*** | The standard with which a product or a food lot is determined to be acceptable based on the absence or presence, or number of micro-organisms and / or quantity of their toxins / metabolites, per unit(s) of measurement. |
| ***Microbiological limits*** | Limits used in meat microbiological criteria which are based on microbiological data appropriate to the meat and which are applicable to a variety of similar products. |
| ***National executive officer*** | Means the officer designated as such in terms of section 2(1) of the Meat Safety Act, 2000 (Act No. 40 of 2000). |

| | |
|---|---|
| ***Official Veterinarian*** | Means a veterinarian appointed either at national or provincial government level, or a non-government appointed veterinarian delegated as such by the competent authority of South Africa to render an official veterinary service. |
| ***Safe for human consumption*** | Safe for human consumption according to the following criteria:<br>• has been produced by applying all food safety requirements appropriate to its intended end-use;<br>• meets risk-based performance and process criteria for specified hazards; and<br>• does not contain hazards at levels that are harmful to human health. |
| ***Veterinary Official*** | Means a suitably qualified official authorised by the controlling authority to perform certain tasks associated with veterinary services. |

**Sampling Plans and Microbiological Limits**

In choosing a sampling plan the guidelines outlined in Codex code of practice: Principles and guidelines for the establishment and application of microbiological criteria related to foods (CAC/GL21 – 1997), must be followed.

For the purpose of sampling the following letters connote:

N = number of units in a lot or consignment

n = number of sample units to be tested

m = minimum value (count) of micro-organisms per gram or per ml below which there would be no risk associated with safety of a food

M = maximum value (count) of micro-organisms per gram or per ml beyond which a lot or consignment would be rejected.

c = the maximum number of sample units, with values between m and M for the lot or consignment to become acceptable.

**PART II**

## 1. INTRODUCTION

1.1 Establishments registered under the Meat safety Act and Veterinary procedural Notices (VPNs) must implement monitoring programs and documented systems whereby the effectiveness of measures to control the hygiene of production can be validated and verified. The microbiological status of meat is used as an indicator of the adequacy of process interventions and process hygiene.

1.2 The microbiological criterion is one of several control points in food safety and should be used by food business operators as a means to verify implementation of an effective Good Hygienic Practice (GHP) and food safety management system.

1.3 Cognizance is taken of progressive developments in the food safety legislation which prescribes certain microbiological standards for certain meats, meat preparations and meat products and monitoring of processing hygiene, including microbiological monitoring of equipment and food contact surfaces.

## 2. PURPOSE AND SCOPE

Establishment operators are required to comply with the microbiological standards for meat and meat preparations/products, process hygiene and process environments by implementing comprehensive microbiological testing programmes. Cognizance is further taken of the requirements of trading partners which may be different to what has been prescribed in this procedure, in which case additional requirements may be implemented for compliance where applicable. This guidance provides comprehensive instructions to designated officials on how they are to protect the public health by properly verifying an establishment's compliance with the hygiene management program, pathogen reduction and sanitation through microbiological verification. This procedure specifies the minimum microbiological sampling plans, criteria and methods of test for microbiological monitoring of meat intended for human consumption under the Meat Safety Act and related VPNs. The procedure defines the minimum requirement to confirm that the meat produced under the hygiene management program is safe and suitable for human consumption. The procedure replaces Standard Operating Procedure (SOP) for Microbiological monitoring of Imported Meat 2011, VPN 15 and any other agreements with regard to bacteriological requirements.

This procedure derives its mandate from the Meat Safety Act, 2000 (Act No. 40 of 2000) and the Animal Diseases Act, 1984 (Act No. 35 Of 1984). The Meat Safety Act, 2000 provides for measures to promote meat safety and the safety of animal products. The National Executive Officer (NEO) may examine, sample and test any animal, meat or animal product. The Animal

## 3. LEGISLATION

This procedure derives its mandate from the Meat Safety Act, 2000 (Act No. 40 of 2000) and the Animal Diseases Act, 1984 (Act No. 35 Of 1984). The Meat Safety Act, 2000 provides for measures to promote meat safety and the safety of animal products. The National Executive Officer (NEO) may examine, sample and test any animal, meat or animal product. The Animal Diseases Act, 1984 provides for the control of animal diseases and parasites, for measures to promote animal health, and for matters connected therewith.

## PART III

## 1 RESPONSIBILITIES

### 1.1 Establishment responsibilities

1.1.1 The owner must prepare a list of all potential biological, chemical or physical hazards that may occur at each step of the process, including –

1.1.1.1 unacceptable contamination or recontamination of a biological, chemical or physical nature.

1.1.1.2 unacceptable survival or multiplication of pathogenic micro-organisms.

1.1.1.3 unacceptable production or persistence of toxins or other undesirable products of microbial metabolism.

1.1.2 The owner must prepare written hygiene management programmes (HMP) to prevent, eliminate or reduce hazards to acceptable levels and must –

1.1.2.1 ensure that management programmes for each hazard is implemented.

1.1.2.2 establish critical limits and control limits for critical and control points.

1.1.2.3 establish a monitoring or checking system for each control point.

1.1.2.4 prepare written corrective actions that must be taken without hesitation when a deviation is observed and such corrective action must specify –

1.1.2.4.1 the persons responsible to implement the corrective action.

1.1.2.4.2 the means and action required for each hazard.

1.1.2.4.3 the action to be taken with regard to the meat having been processed during the period when the process was out of control.

1.1.2.4.4 a written record of measures taken must be kept.

1.1.3 The owner of the establishment must provide sampling programmes for laboratory analyses, as well as names of registered laboratories to do the required analyses.

1.1.4 A registered establishment handling meat must therefore conduct regular monitoring of the general hygiene conditions of production in the establishment, by implementing and maintaining a procedure developed in accordance with the HACCP based principles. The microbiological monitoring must at minimum cover products, personnel, water and environment e.g. drains, utensils, fittings and machinery, at all stages of production.

1.1.5 Maintain accurate records of microbiological tests results as prescribed as part of the Hygiene Management System.

1.1.6 Records of microbiological analysis shall be retained at the establishment for a minimum period of 3 years and shall be made available to designated officials upon request.

1.1.7 Meeting all costs in this respect.

1.1.8 The establishment must ensure that they receive laboratory results from the laboratories used at agreed frequency.

1.1.9 Review all microbiological test results and implement data management procedure.

1.1.10 Implementing corrective actions where unsatisfactory results are obtained.

1.1.11 The establishment must outline procedures to be followed when a deviation occurs and must record the deviations and actions taken when such deviations occurs. as defined in related VPNs.

1.1.12 Slaughter and dressing procedures must limit any contamination to the absolute minimum.

**1.2 Official responsibilities**

1.2.1 The veterinary official must verify that establishments are complying with meat safety and process hygiene criteria, which include availability of written procedures on sampling, sample collection, recording of test results and corrective actions in the case of deviations.

1.2.2 The Veterinary Official must:

1.2.2.1 review all microbiological test results and take these into account when evaluating the efficacy of the Hygiene Management System at the establishment.

1.2.2.2 inform the management of the establishment of any negative trends not addressed during the review by the FBO.

1.2.2.3 conduct or request for extra sampling if deemed necessary.

1.2.2.4 verify the correct implementation by the establishments of food safety criterion and process hygiene criterion.

1.2.2.5 investigate instances where unsatisfactory results were obtained.

1.2.2.6 monitor the effectiveness of corrective actions and take the necessary steps, including legal recourse if necessary.

1.2.2.7 the Veterinary Official shall carry out verification sampling at regular intervals.

**PART IV**

## 1 MICROBIOLOGICAL SAMPLING PROGRAMME

### 1.1 Recommended sampling points

1.1.1 Carcasses:

Samples are to be collected prior to final chilling.

1.1.2 Primal cuts:

- Samples are to be collected prior to final chilling or freezing, before packaging, wrapping or bulk packing into cartons.

1.1.3 Packed meat including trimmings, mechanically deboned meat (MDM) and mechanically recovered meat (MRM, offal and other meat products.

- Samples are to be collected immediately prior to closing and sealing of packages. Samples can be collected prior to chilling or freezing.

1.1.4 At applicable cold stores chilled and frozen (carcasses, cuts, MDM/MRM, trimmings offal and other meat products)

- Samples are to be collected at designated points prior to release.

### 1.2 Sampling sites and size

1.2.1 At least five units (carcasses, boxes, cuts or packages) must be sampled at random during each sampling session. This must take into consideration the number of units being slaughtered or received.

1.2.2 When sampling for microbiological analyses, four sites of each carcass may be sampled.

1.2.3 Tissue samples <2mm thick) shall be obtained by the destructive method.

1.2.4 When using the non-destructive method for this purpose, the sampling area shall cover a minimum of 100 $cm^2$ (25 $cm^2$ for small carcasses) per sampling site.

1.2.5 When samples are taken from the different sampling sites on the carcass, they shall be pooled before examination.

1.2.6 Depending on the requested analysis, pooled samples in a sterile bag should weigh ± 25 - 325 grams each. The total number of grams per pooled sample must always be > 25 g for the analyses of Listeria monocytogenes or Salmonella spp.

### 1.3 Surface and tissue sampling and sampling frequency

Table 1: Type of sample, product to be sampled, sampling sites and size.

| Type of sample | Products to be sampled | No. of units to be sampled | No. of sites per unit to be sampled | Location of sample sites | Sample size per sample site |
|---|---|---|---|---|---|
| Swab | Carcasses(1) (2)) | ≥5 carcasses | 4 | Refer to ISO 17604 and Annexures 4 & 9 | 100 $cm^2$ |
| Tissue | Carcasses (1) (2) | ≥5 carcasses | 4 | Refer to ISO 17604 See Annexures 4 & 9 | ≤2mm thick |
| Tissue | meat cuts(1) (2) | ≥5 units | - | Not prescribed but must be risk based | ≤2mm thick |
| Tissue | Meat trimmings, preparations(1) (2) | ≥5 units | - | Not prescribed but must be risk based | 25g |
| Tissue | Offal and other related meat products(1) (2) | 5 units | - | Not prescribed but must be risk based | 25g |

*Footnote:*

*(1) Where more than one species are slaughtered /processed at an establishment, each species must be scheduled for sampling to ensure that equal sampling representation is done for each species.*

*(2) Randomly selected as written in the procedure.*

Table 2: Sampling frequency for carcasses

| **Species** | **Sampling Frequency** |
|---|---|
| Bovine, Equine and category B wild and farmed game | One (1) pooled sample from at least five (5) carcasses for every 135 animals slaughtered/equivalent Kg of meat processed<br>OR<br>Pooled samples at least once per week OR weekly |
| Ovine, Caprine, Porcine, category C farmed and wild game | One (1) pooled sample from at least five (5) carcasses for every 1800 animals slaughtered/equivalent Kg of meat processed<br>OR<br>Pooled samples at least once per week OR weekly |
| Ostriches | One (1) pooled sample from at least five (5) carcasses for every 500 birds slaughtered/equivalent Kg of meat processed<br>OR<br>Pooled samples at least once per week OR weekly |
| Crocodile | One (1) pooled sample from at least five (5) carcasses for every 200 crocodiles slaughtered/equivalent Kg of meat processed<br>OR<br>Pooled samples at least once per week OR weekly |
| Poultry and rabbit | One (1) pooled sample from at least five (5) carcasses for every 13500 poultry or rabbit slaughtered/equivalent Kg of meat processed<br>OR<br>Pooled samples at least once per week OR weekly |

1.3.1 The selected day of sampling as stated in the sampling plan may be changed to ensure that each day of the week is covered.

1.3.2 The sampling frequency may be readjusted when the sampling results are within the permissible limits.

1.3.3 Sampling frequency for salmonella and/or campylobacter in poultry meat may also be adjusted if there are national or provincial salmonella and/or campylobacter control programmes in place and if these programmes demonstrate that the prevalence of these microorganisms is low in animals generally slaughtered at the particular abattoir.

1.3.4 An establishment operating under a validated HACCP plan may substitute an alternative frequency for the frequency of sampling required provided that the alternative frequency is adequate to verify the effectiveness of the establishment's processing controls.

### 1.4 Requirements for sampling room/inspection room/areas according to VPN 38

| **Subject** | **part III** |
|---|---|
| • stainless steel tables<br>• hand basins with germicidal soap<br>• hot and cold water or lukewarm water of at least 40˚C<br>• disposable paper towels,<br>• foot operated waste bin<br>• Appropriate equipment for sampling of chilled or frozen products<br>• Suitable facilities for sterilization (flame method and OR hot water above 82ºC) and for disinfecting of sampling equipment | 2.3 (iv) |
| • inspection light that does not distort colours and at least 540 lux<br>• protected (enclosed) to prevent contamination of the products in the event of breakage | 2.3 (iv)(b); 2.2 (xvi) |
| • maintained in a sound condition:<br>▪ smooth,<br>▪ impervious<br>▪ resistant to wear and corrosion<br>• no cracks or open seams/joints<br>• easy to clean and where necessary to disinfect<br>• light coloured; impervious, non-absorbent, washable and non-toxic<br>• the floor must be impervious, clean and dry<br>• proper drainage system and ventilation | 2.2 (x);(xi);(xii);(xiii) ;2.3(v) |
| • good housekeeping standards maintained | 2.2 (vii) |
| • maintained in an appropriate and suitable state of cleanliness | 2.2 (xvii) |

### 1.5 Sanitation in handling samples

1.5.1 Personnel are to use aseptic handling procedures identified when collecting samples.

1.5.2 Import inspection personnel are to properly clean and sanitize affected equipment before and after sample collection to prevent cross-contamination of the sample and of inspection consignments after collection of the sample.

1.5.3 Personnel are to:

1.5.3.1. Sanitize all non-disposable equipment before collecting samples. Immerse equipment e.g. chisel, template, bits, scalpels and forceps in 82°C water for 10 seconds or by using flaming method with denatured alcohol. Allow it to cool before drilling so there is no heat damage to the bacteria in the collected samples.

1.5.3.2 Wash and scrub hands thoroughly to the mid-forearm, using antibacterial hand soap (or a hand sanitizer at 50 ppm chlorine equivalency, if available).

1.5.3.3 Open the bag without contaminating the interior, by grasping the side with fingers.

1.5.3.4 Peel and open the package of sterile gloves from the top without contaminating the exterior of the gloves;

1.5.3.5 Remove a glove by holding it from the wrist side opening inner surface. Avoid any contact with the outer surface of the glove;

1.5.3.6 Insert hand without puncturing the glove;

1.5.3.7 Discard glove and use another sterile glove if there is a concern that it may have been contaminated;

1.5.3.8 Collect the sample with the gloved hand from the randomly identified sample unit located on the surface perimeter of the product. Place the sample into the opened bag; and

1.5.3.9 Close the bag and discard the glove.

**1.6 Selecting Samples**

1.6.1 In case of imported meat, identify each shipping container selected for sampling.

1.6.2 Select random cartons, packages or carcasses of meat and convey them to the sampling area.

1.6.3 The carton(s) from which the laboratory sample was obtained is identified by labelling with the sample label number.

1.6.4 Observe import establishment personnel's handling and removal of the unit to be sampled.

1.6.5 Samples must be collected from different sites in the different boxes to be sampled.

NB. The responsible official may collect additional samples or a sample of larger size to be tested for specific pathogens.

**1.7 Sampling equipment and materials**

To take samples from meat, prepare a sampling kit containing:

-sterile gloves;
-sterile sample bags;
-electric or hand drill with drill bit (22 mm or larger) and cork borer;
-electric saw;
-sterile samples bags;
- template (50 x 50 mm, preferably of stainless steel wire);
-forceps, and scalpel, scissor or knife;
-hammer and chisel (19 mm or wider);
-denatured alcohol (methylated spirits) and lamp or lighter/ alcohol wipes;
-frozen chiller packs and foam polystyrene box;
-permanent marking pen and
-elastic bands and seals

**1.8 Sampling methods**

1.8.1 Destructive method

1.8.1.1 Scalpel and forceps or cork borer:

- Applicable to chilled meat and offal

1.8.1.2 Hammer and Chisel method:

- Applicable to frozen meat and offa**l**

1.8.1.3 Electric saw, electric/hand drill and other appropriate equipment:

- Applicable to frozen meat and offal

1.8.2 Sampling procedure

1.8.2.1 Select random cartons of meat and convey them to the sampling area.

1.8.2.2 Loosen the enclosed frozen product by hitting the carton against a hard protected surface. Open the outer packaging

1.8.2.3 Disinfect the surface of the plastic wrapping the product with a disinfectant.

1.8.2.4 Carefully trim away plastic with sterile scalpel. Care should be taken not to let the outer surface of the plastic cover touch the product.

1.8.2.5 Wear a pair of disposable gloves. A new pair of sterile gloves should be worn every time the sample is removed by means of hands to avoid cross contamination.

1.8.2.6 Cut the surface of the meat or offal at a depth of 2mm thickness.

1.8.2.7 For individually frozen portions not loosened, loosen the portions using a sterilized chisel and hammer and place the whole portion(s) inside a sterile sample bag.

1.8.2.8 Properly label the sample.

1.8.2.9 Place the sample in a cooler-box/container between the layers of ice.

1.8.2.10 The sample submission form must accompany the sample.

1.8.2.11 Immediately after sampling the sample must be transported to the laboratory and be processed within 36 hours of sampling.

1.8.3 Sampling of poultry carcasses

1.8.3.1 Open the outer packaging as explained above (1.8.2).

1.8.3.2 When carcasses are individually packed, aseptically remove a wrapped carcass randomly from the box and place it in a sample bag.

1.8.3.3 When not individually packed, the sampling sites must include the neck skin, wings, back, thighs, drumstick and breast.

1.8.3.4 At the laboratory, sample preparation must ensure that the neck skin, wings, back, thighs, drumstick and breast are sampled.

1.8.3.5 For process hygiene sampling at the abattoir, sample neck skin.

1.8.4 Non-destructive method

1.8.4.1The method is commonly used for carcasses and high value large intact cuts.

1.8.4.2 When using the non-destructive method (swabbing) for this purpose, the sampling area from each site covers a minimum of 100 $cm^2$ for large carcasses and 25$cm^2$ for small carcasses per sampling site of which a minimum of 4 sampling sites are required per carcass.

1.8.4.3 Further guidelines on sampling sites can be obtained in ISO 17604.

1.8.5 Transportation of samples to the analysing laboratory

1.8.5.1 The transportation of meat samples must ensure that the integrity of the samples is maintained at all times. The authorised official may allow a third party (e.g. laboratory, cold store or courier service) to transport samples between point of sampling and laboratories.

1.8.5.2 The following factors must be adhered to, to ensure the integrity of the samples during transportation:

1.8.5.2.1 Maintenance of the cold chain – the temperature of must be maintained below +4°c at all times.

1.8.5.2.2 Maintenance of the microbiological status of the samples – the samples must be handled in such a manner so as to ensure that they are not contaminated in any way.

1.8.5.2.3 Maintenance of the identity / traceability of the samples – the samples must be handled and packaged in such a manner so as to ensure that the traceability of the samples to the relevant source or consignment is maintained. This must include ensuring that the samples cannot be manipulated (altered / swapped / treated) at any stage of transportation.

1.8.5.2.4 Security of the samples – where the samples are not transported by an authorised official, the container must be sealed by an authorized official and the seal number recorded on the sample submission form.

1.8.5.3 Prior arrangement with the laboratory must be made to ensure that the testing can be carried out on the day of sampling.

1.8.5.4 The laboratory must reject samples that are not compliant to temperature requirements and immediately notify the abattoir and authorised official responsible for the monitoring of the abattoir. The abattoir must repeat the sample collection.

1.8.5.5 Laboratory analysing methods must be SANAS accredited or endorsed by Daff.

1.8.5.6 Presentations/evaluations of results shall take cognisance of sampling method.

1.8.5.7 The laboratory report should contain the following details:

1.8.5.7.1 Time and date of receipt of the sample at the laboratory and temperature of sample.

1.8.5.7.2 Proper identification of the sample especially pertaining to the point of collection.

1.8.5.7.3 Confirmation that the prescribed collection method was followed in the collection of the sample. (if the sample is collected by personnel of the laboratory doing the analysis.)

1.8.5.7.4 Confirmation that the prescribed transport steps were followed.

1.8.5.7.5 Confirmation that the correct handling procedures were followed at the laboratory.

1.8.5.7.6 Date and time of analysis at the laboratory.

1.8.5.7.7 Time of reading results.

1.8.5.7.8 Results of the analysis.

1.8.5.7.9 Range of criteria for evaluation.

**1.9 Methods of microbiological examination**

For microbiological examination, use the most recent ISO/SANS methods or any other accredited method validated against the reference method and giving results that are better, or at least equal, to the accuracy of the reference method and approved as fit for purpose by the National Executive Officer. For selected foodborne pathogens, accredited ISO methods or their equivalent shall apply.

**PART V**

## 1 MICROBIOLOGICAL REFERENCE CRITERIA

### 1.1 Meat safety performance objectives

Table 3: Meat safety performance objectives for Salmonella spp (S. Enteritidis; S.Typhimurium; S. Heldelberg and S.Infantis), Listeria spp (Listeria monocytogenes) and Campylobacter spp (C.coli and jejuni).

-Where Salmonella spp and Campylobacter spp is found, the isolates shall be further serotyped in order to verify compliance with the microbiological criterion set out for serotypes of significant risk to public health (pathogenic).

-Where contaminated meat is to be released on the market, food safety declarations shall be made available to the subsequent purchasers, product identification and traceability shall be required along the entire food chain and such meat shall be accompanied with food safety handling instructions

| Class of Product | Foodborne pathogen | Performance Standard (percent positive for the foodborne pathogen) | n | c |
|---|---|---|---|---|
| Poultry | Salmonella spp | 5 | 15 | 1 |
| | Listeria monocytogenes | 11.75 | 24 | 3 |
| | Campylobacter jejuni and coli | 25 | 25 | 7 |
| Beef | Salmonella spp | 5 | 15 | 1 |
| | Listeria monocytogenes | 17 | 35 | 6 |
| | Campylobacter jejuni and coli | DNA | DNA | DNA |
| Pork | Salmonella spp | 5 | 15 | 1 |
| | Listeria monocytogenes) | 13.3 | 13 | 2 |
| | Campylobacter jejuni and coli | 9.63 | 20 | 2 |
| Wild Game | Salmonella spp | 0.04 | 25 | 1 |

| | | | | |
|---|---|---|---|---|
| | Listeria monocytogenes | 3 | 33 | 1 |
| | Campylobacter jejuni and coli | DNA | DNA | DNA |
| Ostrich | Salmonella spp | 0.04 | 25 | 1 |
| | Listeria monocytogenes | DNA | DNA | DNA |
| | Campylobacter jejuni and coli | DNA | DNA | DNA |
| Rabbit | Salmonella spp | DNA | DNA | DNA |
| | Listeria monocytogenes | DNA | DNA | DNA |
| | Campylobacter jejuni and coli | DNA | DNA | DNA |
| Mutton/goat | Salmonella spp | DNA | DNA | DNA |
| | Listeria monocytogenes | DNA | DNA | DNA |
| | Campylobacter jejuni and coli | DNA | DNA | DNA |

PS- Performance standard

n- Number of samples tested

c- Maximum number of positives to achieve (c)

DNA- Data not available

**1.2 Meat safety performance objectives for other meat borne pathogens**

Table 4: Shiga toxin E.coli (STEC)*, Staphylococcus aureus, Clostridium perfringens and Yersinia enterocolitica.

| **Product category** | **Micro-organisms** | **Sampling Plan** | | **Limits** | | **Analytical Reference Method** |
|---|---|---|---|---|---|---|
| | | **n(1)** | **c(2)** | **m(3) (log value)** | **M(4) (log value)** | |
| Game, beef and pork | Shiga toxin E.coli (STEC)* | 5 | 0 | Absent in 25g | - | ISO/TS 13136 |
| Meat, offal, MDM/MRM/MDP | | | | | | |
| | *Staphylococcus* | 5 | 3 | 1 cfu/cm$^2$ | 100 cfu/cm$^2$ | ISO 6888- |

| | | | | | | |
|---|---|---|---|---|---|---|
| of all species and related products | *aureus* | | | (0 log) | (2.0 log) | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Meat, offal, MDM/MRM/MDP of all species and related products | *Clostridium perfringens* | 5 | 2 | 1 cfu/cm$^2$ (0 log) | 100 cfu/cm$^2$ (2.0 log) | ISO 6888-1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Meat, offal, MDM/MRM/MDP of all species and related products | *Yersinia enterocolitica* | 5 | 2 | 1 cfu/cm$^2$ (0 log) | 100 cfu/cm$^2$ (2.0 log) | ISO 6888-1 |

**Applies to the following STEC serotypes O26, O45, O103, O121, O145 and O157 and where presence of eae or ehxA genes plus stx1and or stx2 is demonstrated.*

### 1.3 Process hygiene /indicator organisms

Table 5: Process Hygiene performance objectives

| **Category** | **Micro-organisms** | **Sampling Plan** | | **Limits** | | **Analytical Reference Method** |
|---|---|---|---|---|---|---|
| | | **n** | **c** | **m (log value)** | **M (log value)** | |
| Carcasses and meat cuts of wild cloven hoofed game and wild solipeds | Aerobic colony count | 35 | 7 | cfu/cm$^2$ (3.5 log) | 100 000cfu/ cm$^2$ (5.0 log) | ISO 4833 |
| | Enterobacteriaceae | 35 | 11 | 100 cfu/cm$^2$ (2.0 log) | cfu/cm$^2$ (2.5 log) | ISO 21528-2 |
| | *E.coli* | 35 | 11 | 50 cfu/cm$^2$ (1.7 log) | 500 cfu/cm$^2$ (2.7 log) | ISO 16649-2 |
| | | | | | | |
| Carcasses and | Aerobic colony | 35 | 7 | cfu/cm$^2$ | 100 000cfu/ | ISO 4833 |

| | | | | | | |
|---|---|---|---|---|---|---|
| meat cuts of poultry, rabbit, crocodiles and ostrich | count | | | (3.5 log) | $cm^2$ (5.0 log) | |
| | Enterobacteriaceae | 35 | 7 | 100 $cfu/cm^2$ (2.0 log) | $cfu/cm^2$ (2.5 log) | ISO 21528-2 |
| | *E.coli* | 35 | 7 | 10 $cfu/cm^2$ (1.0 log) | 100 $cfu/cm^2$ (2.0 log) | ISO 16649-2 |
| Carcasses and meat cuts of cattle, sheep, goats and horses | Aerobic colony count | 5 | 3 | $cfu/cm^2$ (3.5 log) | 100 000$cfu/cm^2$ (5.0 log) | ISO 4833 |
| | Enterobacteriaceae | 5 | 2 | $cfu/cm^2$ (1.5 log) | $cfu/cm^2$ (2.5 log) | ISO 21528-2 |
| | *E.coli* | 5 | 2 | 1 $cfu/cm^2$ (0 log) | 100 cfu/ $cm^2$ (2 log) | ISO 16649-2 |
| | | | | | | |
| Frozen meat, red offal, MDM/MRM, trimmings and related products of all species | TVC | 5 | 3 | $1X10^5$ cfu/g | $1X\ 10^6$ cfu/g | ISO 4833 |
| | | | | | | |
| | *E.coli* | 5 | 3 | $1X10^2$ cfu/g | $1X\ 10^3$ cfu/g | ISO 16649-2 |

**1.4 Evaluation of results**

1.4.1 Evaluation of results is based on a 2 or three class outcome system. Performance of the sampling plans is defined by parameters, N, M, n, and c.

1.4.2 Assessment is by means of a moving window.

1.4.2.1 at abattoirs and cutting plants assessment is by means of a moving window which is regarded as the last sample result and those preceding it up to the value of n.

1.4.2.2 as new sample results become available this will cause the window to move on including the new samples as part of the sampling plan or window (n) assessment.

1.4.2.3 to allow for corrections in the process to be evaluated a window will be reset after each failure and subsequent corrective actions. (refer to annexures 2 & 3).

1.4.2.4 test results that do not meet the criteria described in this procedure are an indication that the establishment may not be maintaining process controls sufficient to prevent contamination.

1.4.2.5 when a sample window fails the establishment must immediately inform the State Veterinarian.

1.4.2.6 the establishment must also initiate an investigation into the causative factors and implement the necessary corrective and preventative actions.

1.4.2.7 preventative actions may include improvements in slaughter hygiene and review of process controls, origin of animals and of the biosecurity measures in the farms of origin.

1.4.2.8 this must be recorded in the Corrective Action of the Hygiene and meat safety management programme of the establishment.

1.4.2.9 where a sampling plan/ window have failed export certification may be withheld by the State Veterinarian until corrective actions have been completed to his/her satisfaction.

1.4.2.10 the meat safety risk involved as well as the extent of the investigation, the corrective actions implemented by the establishment and possible pattern of recurrence of unacceptable results will be the determining factors in making the decision.

1.4.2.11 the establishment must, in addition to recording of results in the format prescribed in annex 2 of the procedure, also depict the average of all microbiological sample results obtained for each week, graphically, where average results maybe plotted against every week of the year.

**PART VI**

## 1 PROCEDURE IN CASE OF MICROBIOLOGICAL DEVIATION

1.1 Failure to meet criteria. Test results that do not meet the criteria described are an indication that the establishment may not be maintaining process controls sufficient to prevent contamination. Further action as appropriate shall be taken to ensure that all applicable provisions of the law are being met.

1.2 An establishment's meat or its products, when sampled and tested by the establishment and or competent authorities as set forth in this document, must not test positive at a rate exceeding the applicable performance standard.

1.3 When it is determined that an establishment has not met the set bacteriological criterion and the performance standard, the establishment shall take immediate action to meet the requirement including reassessing its hygiene management program.

1.4 Failure by the establishment to act and failure to meet the standard on the third consecutive series of conducted tests for that product, constitutes failure to maintain sanitary

conditions and failure to maintain an adequate hygiene management program, for that product, and will cause the competent authority to institute suspension of inspection services and in the case of import registered establishments temporal removal of the establishment from the list of approved export establishments.

1.5 Such suspension will remain in effect until the establishment submits satisfactory written assurances to be verified detailing the action taken to correct the deviation and, as appropriate, other measures taken by the establishment to reduce the prevalence of pathogens.

1.6 The competent authority shall take further action as appropriate to ensure that all applicable provisions of the Meat Safety Act 40, 2000 and other applicable laws are being met.

1.7 If an establishment fails to test and record, enforcement will be instituted in accordance with rules of practice in VPN 18 and the Meat Safety Act 40, 2000.

1.8 In case of imported meat or meat products, refer to Certificate of Rejection of Imported meat.

**PART VII**

**1 GUIDELINES ON MICROBIOLOGICAL SAMPLING FOR CHECKS ON EQIPMENT AND ENVIRONMENTAL HYGIENE IN ESTABLISHMENTS**

**1.1 Sampling methods**

1.1.1This part describes the contact plate method and the swab technique. The use of these methods is limited to the testing of dry, flat, sufficiently large and smooth surfaces, which are cleaned and disinfected. These methods should always be applied before production starts. If visible dirt is present cleaning should be judged as unacceptable without any further microbiological evaluation. Methods offering equivalent guarantees may be used after approval by the controlling authority.

1.1.2 Agar contact plate method

For the agar contact plate method, small plastic dishes with lids (i.e. internal diameter 5,0 cm) filled with plate count agar (according to ISO, actual version) and dishes filled with violet red bile glucose agar (VRBG agar according to ISO, actual version) are pressed on to each sampling site and subsequently incubated. The contact surface of each plate is 20 $cm^2$. After preparation the agar has a shelf life of approximately three months when kept at 2 to 4 °C in closed bottles. Shortly before preparation of the plates, the relevant agar has to be melted to 100 °C and cooled to 46 to 48 °C. The plates have to be placed in a laminar air flow cabin

and should be filled with agar until a convex surface is obtained. The prepared plates should be dried before use by incubating them upside down overnight at 37° C. This is also a useful check for possible contamination during preparation; plates with visible colonies must be discarded. The plates have a shelf life of one week at 2 to 4 °C, when sealed in plastic bags.

1.1.3 Procedure:

1.1.3.1 Remove the contact plate from the transport container.

1.1.3.2 Correctly label the contact plates with sufficient detail.

1.1.3.3 Open the plate and press the agar surface (or surfaces) firmly against the test surface without any lateral movement.

1.1.3.4 For contact plates, optimal results have been obtained with a contact time of 10 seconds and a pressure obtained with a mass of 500g.

1.1.3.5 Close the contact plates and return them to the transport container.

1.1.3.6 Clean the sampled area with an alcohol wipe.

1.1.4 Swab technique:

Samples must be taken in accordance with the swab technique prescribed in the Efficacy of Cleaning Plant, Equipment and Utensils - SANS 5763.

### 1.2 Sampling frequency

A minimum of 10 samples or up to 30 samples in a large production area should always be carried out within a period of two weeks. If the results are satisfactory over a period of time the frequency of sampling may be reduced. Places which should receive most attention are the areas which are destined to come or may come into contact with the product. Approximately two thirds of the total number of samples should be taken from food contact surfaces. To ensure that all surfaces are tested in the course of a month, a schedule should be made indicating which surfaces should be sampled on which days. The results must be recorded and regular bar charts are to be made to show the developments with time.

### 1.3 Transportation of samples

The used contact plates do not need to be cooled during transport and before incubation.

Swab samples must be cooled to below 4 °C until further processing. The transportation of the samples must comply with the regulations as set out in the National Road Traffic Act 93 of 1996 which is intended to promote the safe transportation of hazardous material through the effective management of systems and processes.

### 1.4 Microbiological procedures

In addition to the given description, ISO-methods may be used. The bacterial counts should be reported according to the number of organisms per $cm^2$ of surface area. Inoculated agar contact plates must be incubated for 24 hours at 37 °C under aerobic conditions for aerobic colony count (acc). This procedure must take place within two hours of sampling. The number of bacterial colonies should be counted and recorded and analysed. For quantitative estimation of Enterobacteriaceae VRBG agar must be used. Incubation of inoculated plates and agar contact plates must begin within two hours of sampling under aerobic conditions. After 24 h incubation at 37°c the plates must be examined for Enterobacteriaceae growth.

### 1.5 Sampling sites

The following points should, for example, be chosen as sampling sites: sterilisation devices for knives, knives (junction of blade and handle), hollow blood draining knives, elastrators, scalding tanks, bung bagging machines, scraping/gambrelling ,table (pig), sawblades and cutters, dehiding, other carcase dressing instruments, shackles and containers for transport, transport conveyor belts, aprons, cutting tables, flap doors if touched by passing carcases, chutes for food organs, parts of the line often touched by carcases, overhead structures which may drip moisture, etc.

### 1.6 Calculation and interpretation of results

For the agar contact plates for the acc and Enterobacteriaceae counts of the swab tests, the results are to be entered on a registration form. For the purpose of process control verification of cleaning and disinfection only two categories for acc and Enterobacteriaceae have been established: acceptable and unacceptable. The acceptable range for acc on an agar contact plate and the number of colonies of Enterobacteriaceae from swab tests are shown in table 6.

Table: 6 Minimum and maximum ranges

| Test | Acceptable range | Unacceptable |
|---|---|---|
| Aerobic colony counts (acc) | 0-10/$cm^2$ | > 10/$cm^2$ |
| Enterobacteriaceae | 0-1/$cm^2$ | > 1/$cm^2$ |
| Listeria spp | | Presence in the area tested |

## PART VIII

## 1 TRICHINELLA CONTROLS

1.1 The equine, porcine and crocodile meat is subjected to the controls described in this section.

1.2 Traceability regarding Trichinella examination results will be acceptable if traceability of any suspect or positive sample is traceable to the batch of animals slaughtered and deboned at an export establishment because no Trichinella spp has ever been detected in tested zebra meat

1.3 It must be noted however that in cases where traceability is only possible onto batch level, rather than to an individual carcass, any positive results will result in condemnation of all meat that comprises the particular batch and in cases of suspect results, will result in refusal of all the meat that comprises the particular batch for export certification.

1.4 Where samples are however traceable to individual carcasses, only individual infested or suspect carcasses will either be condemned or refused an export approval mark, if the results are confirmed positive.

1.5 Meat samples may only be examined by a laboratory that has been approved by the Department of Agriculture, Forestry and Fisheries (DAFF), specifically for conducting Trichinella examinations. The laboratory shall inform the Official Veterinarian in charge of the establishment of positive results as soon as they are known. Deltamune is approved by DAFF and all samples must be analysed by this laboratory. The cost of sample analysis is payable by the establishment or exporter.

1.6 Unless a specific Hygiene Management Programme (HMP) to prevent dispatch of export of unapproved meat from the premises has been compiled by the Food Business Operator (FBO) and approved by the Official Veterinarian (OV), export approval marks may only be applied to packaging containing cuts of export meat once the results of the Trichinella examination have been received and if the particular batch of meat tested negative for Trichinella. The aim of the HMP to prevent dispatch or export of unapproved meat from the premises/export establishment is to keep all batches of meat for which Trichinella examination results are pending in bond, until satisfactory results have been received.

1.7 The FBO must compile a contingency plan that will indicate what steps will be taken in case positive Trichinella results are received for a particular batch of meat. This must include, but is not limited to:

1.7.1 Reassessment of the establishment's HACCP based system.

1.7.2 The meat may be subjected to a process that guarantees the destruction of the Trichinella larvae in accordance with the Codex guidelines for the control of Trichinella spp in meat.

1.7.3 Identification, tracing and detention of all the meat that comprises this specific batch of meat that tested positive for Trichinella.

1.7.4 No batches of meat, where a positive Trichinella result has been received or where a suspect result for Trichinella has been received, may be certified for export, unless positive results are traceable to meat from individual, infested carcasses.

1.7.5 Batches of meat where a positive Trichinella result has been received, must be condemned unless the infestation is traced to a single carcass, in which case only that particular carcass and all the meat derived from it, must be condemned and the rest of the batch will be suitable, both export certification.

1.7.6 The Trichinella nematode that was detected must be submitted for species identification.

1.7.7 The state veterinarian responsible for the area where the infested animals originated, and the Director: Animal Health must be informed of the infestation.

1.8 No export certification to the EU may be issued by the OV, unless the requirements of this section, read in conjunction with Commission Regulation (EC) 2075/2005 as amended have been met.

1.9 The NEO may exempt an abattoir(s) from these Trichinella spp sampling frequencies when the NEO has ascertained by risk evaluation that the risk of Trichinella infestation of a particular farmed or wild species is negligible.

1.10 The following samples for Trichinella examination must be collected from each individual carcass as part of the post-mortem inspection procedure and examined as pooled samples:

Table 7: Trichinella sampling

| **Specie** | **Muscle sample site** | **Muscle sample size/carcass** | **Pool size for testing** |
|---|---|---|---|
| Equine | Lingual or Masseter or if these are not available, Diaphragmatic pillar | ≥ 20g | 5 carcasses x 20g/carcass = 100g |
| Crocodile | Pterygoid and/or Masseter and/or Intercostal | ≥20g | 5 carcasses x 20g/carcass = 100g |
| Porcine: all carcasses of | Diaphragm; pillars of | ≥20g | 5 carcasses x |

| | | | |
|---|---|---|---|
| breeding sows and boars and at least 10 % of carcasses of animals sent in for slaughter from each holding | the diaphragm; muscle of the tongue; masseters | | 20g/carcass = 100g |

**PART IX**

## 1 LABORATORIES

1.1 Laboratory functions (refer to Laboratory Registration Guidelines for details).

Receipt of samples

(1) The laboratory must ensure that the testing of samples is initiated within 48 hours after collection of the first sample of the sample set.

(2) The laboratory must deem a sample is unsuitable for testing, reject that sample, and seek replacement samples in that processing week from the operator if:

a) samples arrive too late for testing to commence within 48 hours of time the first sample of the set was taken; or

b) samples received exceed 7ºC; or

c) samples were not taken by a trained and designated sample taker.

Entry to information and records

(1) The laboratory must enter the sample descriptors supplied by the sample taker on the sample submission form into the database if not already entered.

(2) In addition, the laboratory must record the following sample receipt details:

a) confirmation of sample taker is currently listed; and

b) sample temperature; and

c) time from sampling to initiation of analysis; and

d) confirmation that sample is suitable for testing.

1.2 The Laboratory registration program is managed by Daff, Directorate: Veterinary Public Health. Contact details:

The National Executive Officer
Directorate: Veterinary Public Health
Private Bag X 138

Pretoria
0001
Tel: 012-319 7501/7572
Fax: 012- 319 7699
Email address: LizzyM@daff.gov.za/TebogoMON@daff.gov.za



**ANNEX 1**

RECORD FORM FOR MICROBIOLOGICAL RESULTS

| | | | | | | |
|---|---|---|---|---|---|---|
| Establishment: | | Microbiological Results (Specify) | | | | Page No: |
| Sampling Date | Species | Product Sampled | Window & Sample No. | Results (cfu/cm$^2$) | Indicate: Acceptable/Marginal/ Fail | Number of marginal results (Between m& M |
| | | | | | | |
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**ANNEX 2**

Example of evaluation of microbiological results by means of a sample plan/window for aerobic colony counts with reset where n=35, c= 7, m= 3162 cfu/cm$^2$ (log3.5), m=100,000 cfu/cm$^2$(log 5)

| MICROBIOLOGICAL SAMPLE RECORD FORM | | | | | | |
|---|---|---|---|---|---|---|
| Establishment: | | Microbiological results for: Total Viable Counts[1] | | | | Page no: |
| Date | Species | Sample type (product)/Laboratory reference | Sample number/ window number | Result (cfu/g) | Indicate: Acceptable/Marginal/Fail | Number of marginal results (Between m and M) |
| 2009.08.01 | Ostrich | Carcass | 1 (1st window) | 501 | Acceptable | |
| 2009.08.01 | Ostrich | Carcass | 2 | 662 | Acceptable | |
| 2009.08.01 | Ostrich | Carcass | 3 | 1004 | Acceptable | |
| 2009.08.01 | Ostrich | Carcass | 4 | 3161 | Acceptable | |
| 2009.08.01 | Ostrich | Carcass | 5 | 3009 | Acceptable | |
| 2009.08.01 | Ostrich | Primal cuts | 6 | 2990 | Acceptable | |
| 2009.08.01 | Ostrich | Retail portions | 7 | 765 | Acceptable | |
| 2009.08.08 | Ostrich | Carcass | 8 | 328 | Acceptable | |
| 2009.08.08 | Ostrich | Carcass | 9 | 3200 | Acceptable | |
| 2009.08.08 | Ostrich | Carcass | 10 | 3162 | Acceptable | |
| 2009.08.08 | Ostrich | Carcass | 11 | 3170 | Marginal | 1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2009.08.08 | Ostrich | Carcass | 12 | 3456 | Marginal | 2 |
| 2009.08.08 | Ostrich | Primal cuts | 13 | 31 | Acceptable | |
| 2009.08.08 | Ostrich | Retail portions | 14 | 567 | Acceptable | |
| 2009.08.15 | Ostrich | Carcass | 15 | 8097 | Marginal | 3 |
| 2009.08.15 | Ostrich | Carcass | 16 | 97896 | Marginal | 4 |
| 2009.08.15 | Ostrich | Carcass | 17 | 8767 | Marginal | 5 |
| 2009.08.15 | Ostrich | Carcass | 18 | 7865 | Marginal | 6 |
| 2009.08.15 | Ostrich | Carcass | 19 | 3134 | Acceptable | |
| 2009.08.15 | Ostrich | Primal cuts | 20 | 2800 | Marginal | 7 |
| 2009.08.15 | Ostrich | Retail portions | 21 | 3567 | Marginal | 8 (2) |
| 2009.09.22 | Ostrich | Carcass | 1 (2nd Window) | 350 | Acceptable | |
| 2009.09.22 | Ostrich | Carcass | 2 | 356 | Acceptable | |
| 2009.09.22 | Ostrich | Carcass | 3 | 567 | Acceptable | |
| 2009.09.22 | Ostrich | Carcass | 4 | 234 | Acceptable | |
| 2009.09.22 | Ostrich | Carcass | 5 | 123 | Acceptable | |
| 2009.09.22 | Ostrich | Primal cuts | 6 | 657 | Acceptable | |
| 2009.09.22 | Ostrich | Retail portions | 7 | 10345 | Failed | Failed(3) |
| 2009.09.29 | Ostrich | Carcass | 1 (3rd Window) | 978 | Acceptable | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2009.09.29 | Ostrich | Carcass | 2 | 879 | Acceptable | |
| 2009.09.29 | Ostrich | Carcass | 3 | 767 | Acceptable | |
| 2009.09.29 | Ostrich | Carcass | 4 | 645 | Acceptable | |
| 2009.09.29 | Ostrich | Carcass | 5 | 645 | Acceptable | |
| 2009.09.29 | Ostrich | Primal cuts | 6 | 667 | Acceptable | |
| 2009.09.29 | Ostrich | Retail portions | 7 | 367 | Acceptable | (4) |

(1) Specific test organism

(2) Window 1 failed because **c** exceeded 7. A new window is started.

(3) Window 2 failed because sample no. 7 exceeded **M.** A new window is started.

(4) Please note that **n** is always measured from the last 35 sample results listed. (The window used for evaluation is dragged down the list every time new results are added to the data.)

**ANNEX 3**

Example of an evaluation of microbiological results by means of a sample plan/window for aerobic colony counts with reset where n=35, c= 7, m= 3162 cfu/cm$^2$ (log3.5), m=100,000 cfu/cm$^2$(log 5) (check initial values)

| Plant No. | Sample No. | ACC | Moving Window | Sample No. | ACC | Moving Window | Sample No. Results? | Moving Window |
|---|---|---|---|---|---|---|---|---|
| ZA 13 | 1 | 300 | 1st Window | | | | | |
| ZA 13 | 2 | 2500 | | | | | | |
| ZA 13 | 3 | **4000** | | | | | | |
| ZA 13 | 4 | 800 | | | | | | |
| ZA 13 | 5 | **5000** | | | | | | |
| ZA 13 | 6 | 600 | | | | | | |
| ZA 13 | 7 | **10 000** | | | | | | |
| ZA 13 | 8 | 300 | | | | | | |
| ZA 13 | 9 | 200 | | | | | | |
| ZA 13 | 10 | **6000** | | | | | | |
| ZA 13 | 11 | **7000** | | | | | | |
| ZA 13 | 12 | 900 | | | | | | |
| ZA 13 | 13 | **11000** | | | | | | |
| ZA 13 | 14 | 200 | | | | | | |
| ZA 13 | 15 | 4000 | | | | | | |
| ZA 13 | 16 | 500 | | | | | | |
| ZA 13 | 17 | **12000** | Failure(results >m<M but `c' exceeded | | | | | |
| ZA 13 | 18 | | | 1 | 300 | 2nd Window | | |
| ZA 13 | 19 | | | 2 | 800 | | | |
| ZA 13 | 20 | | | 3 | 3000 | | | |
| ZA 13 | 21 | | | 4 | 200 | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ZA 13 | 22 | | | 5 | 350 | | | |
| ZA 13 | 23 | | | 6 | 600 | | | |
| ZA 13 | 24 | | | 7 | 400 | | | |
| ZA 13 | 25 | | | 8 | **150000** | Failure(result >M) | | |
| ZA 13 | 26 | | | 9 | | | 1 And so on | 3rd Window |
| ZA 13 | 27 | | | 10 | | | 2 | |
| ZA 13 | 25 | | | 11 | | | 3 | |
| ZA 13 | 29 | | | 12 | | | 4 | |
| ZA 13 | 30 | | | 13 | | | 5 | |
| ZA 13 | 31 | | | 14 | | | 6 | |
| ZA 13 | 32 | | | 15 | | | 7 | |
| ZA 13 | 33 | | | 16 | | | 8 | |
| ZA 13 | 34 | | | 17 | | | 9 | |
| ZA 13 | (n) 35 | | | 18 | | | 10 | |
| ZA 13 | | | | 19 | | | 11 | |
| ZA 13 | | | | 20 | | | 12 | |
| ZA 13 | | | | 21 | | | 13 | |
| ZA 13 | | | | 22 | | | 14 | |
| ZA 13 | | | | 23 | | | 15 | |
| ZA 13 | | | | 24 | | | 16 | |
| ZA 13 | | | | 25 | | | 17 | |
| ZA 13 | | | | 26 | | | 18 | |
| ZA 13 | | | | 27 | | | 19 | |
| ZA 13 | | | | 28 | | | 20 | |
| ZA 13 | | | | 29 (up to 35) | | | 21(up to 35) | |

1st Window failed because **c** exceeded 7 at sample No. 17. A new window is started. 2nd Window failed because sample no. 8 exceeded **M.** A new window is started, which is 3rd Window, and so on. Please note that **n** is always measured from the last 35 sample results listed. (The window used for evaluation is dragged down the list every time new results are added to the data.)

**ANNEX 4**

Microbiological sampling sites on cattle (including Equine and category B wild and farmed game) and pig carcasses

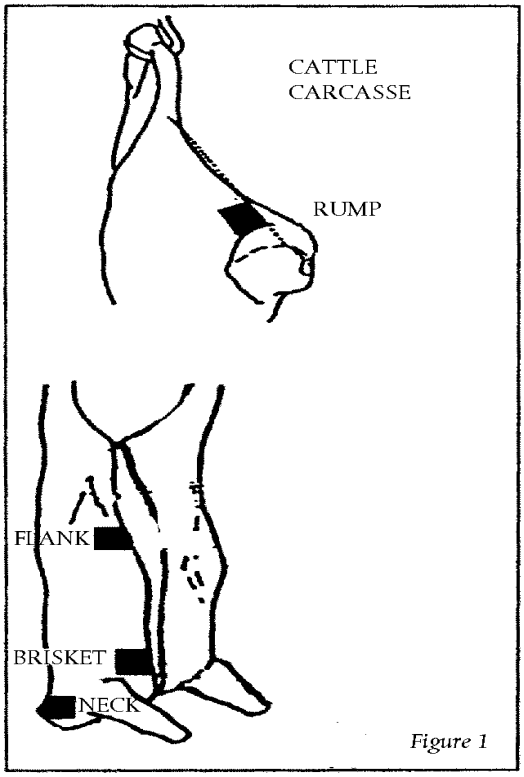


*Figure 1*

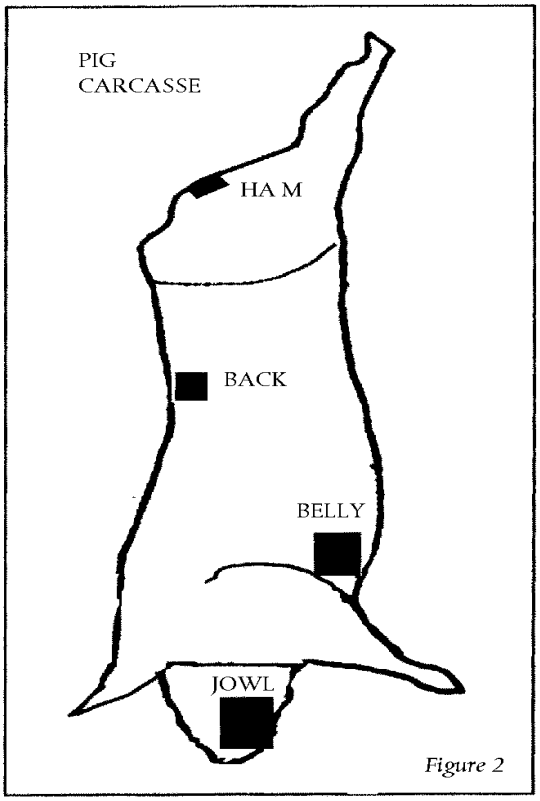
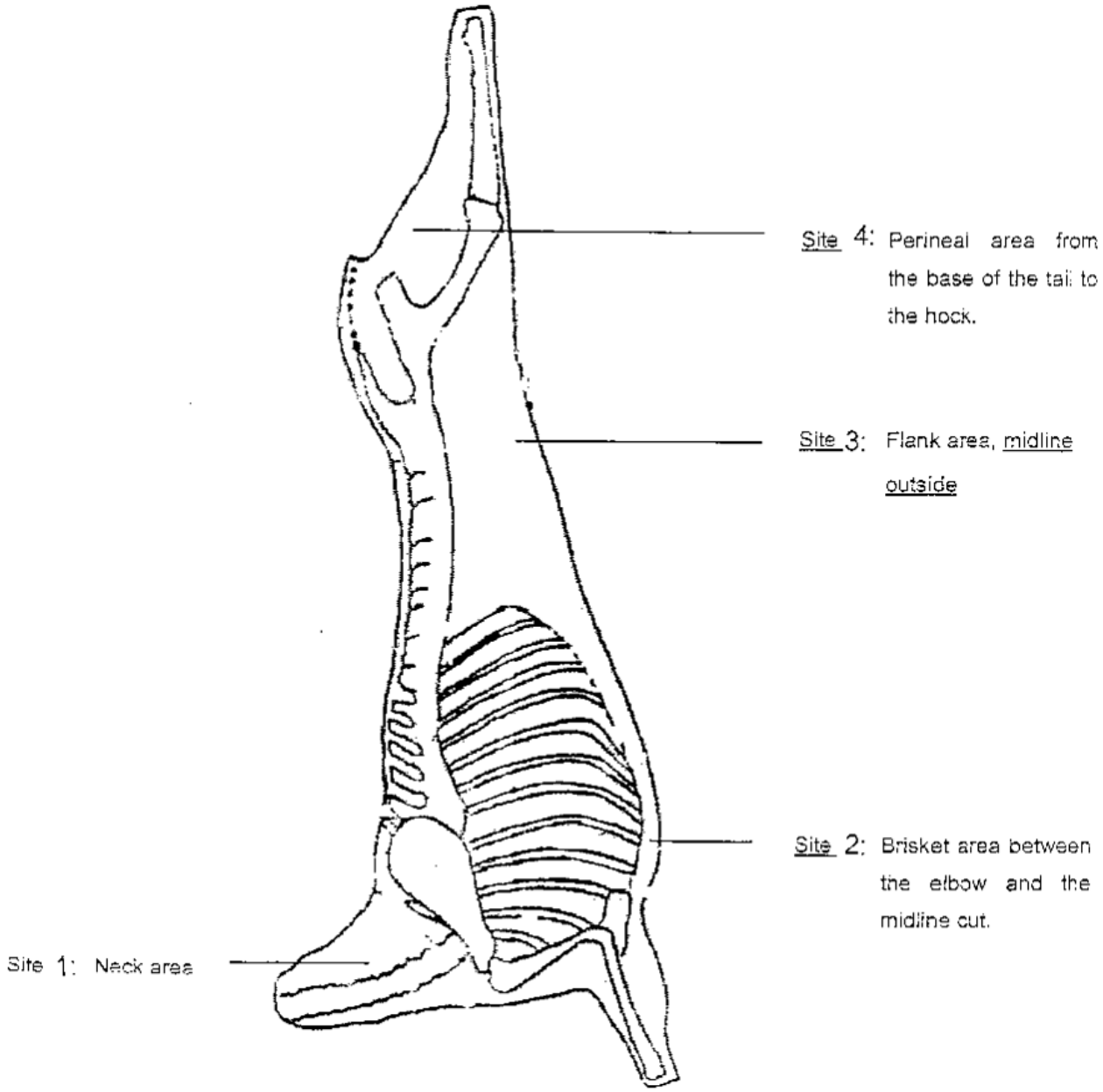


*Figure 2*

**ANNEX 5**

Microbiological sampling sites on sheep and goat carcasses including category C farmed and wild game

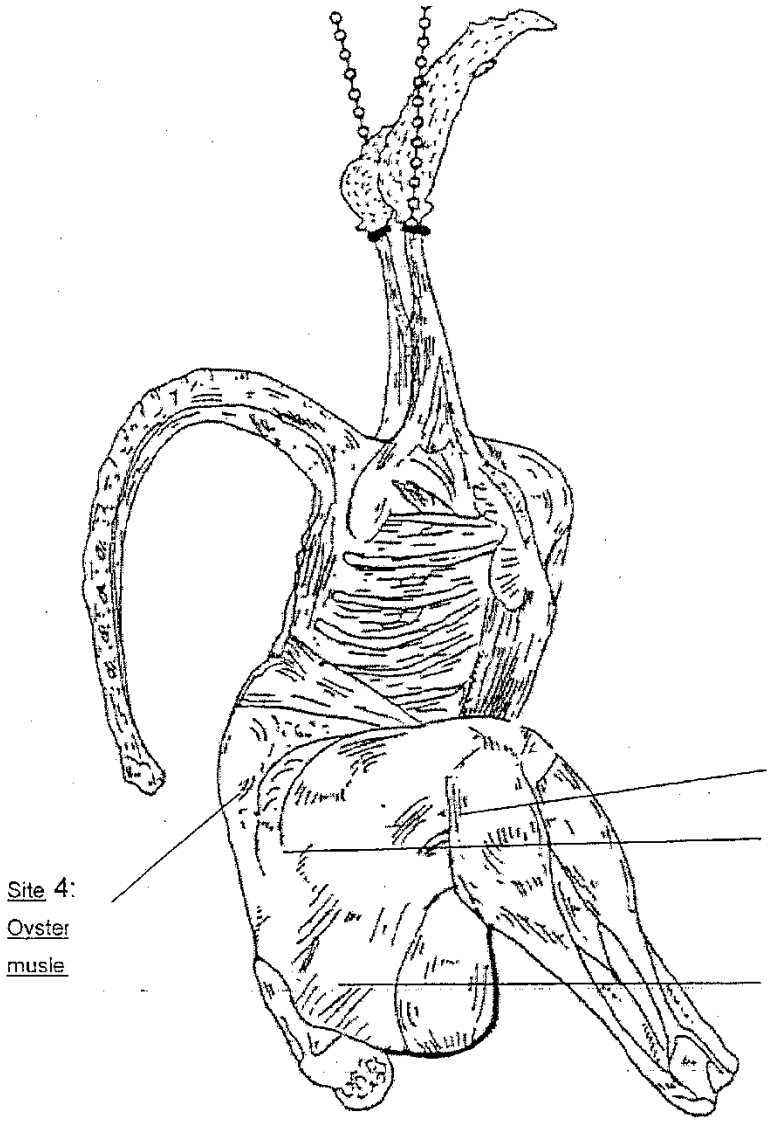


**ANNEX 6**

Microbiological sampling sites on poultry carcasses

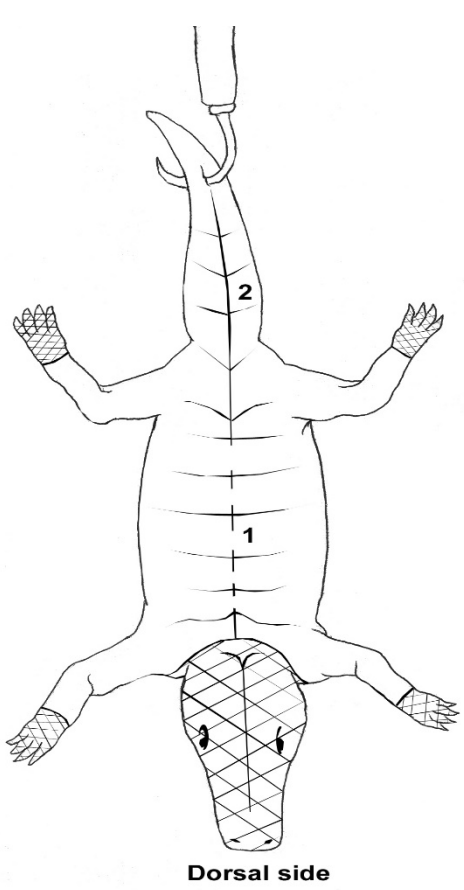
**ANNEX 7**

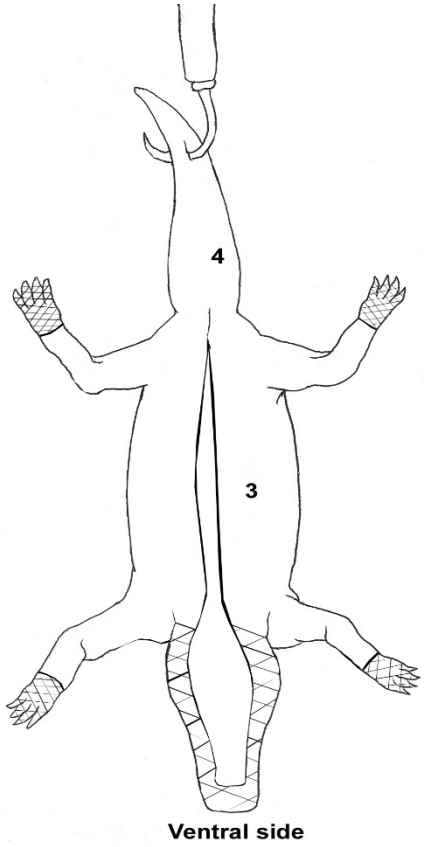
Microbiological sampling sites on ostrich carcasses



**ANNEX 8**

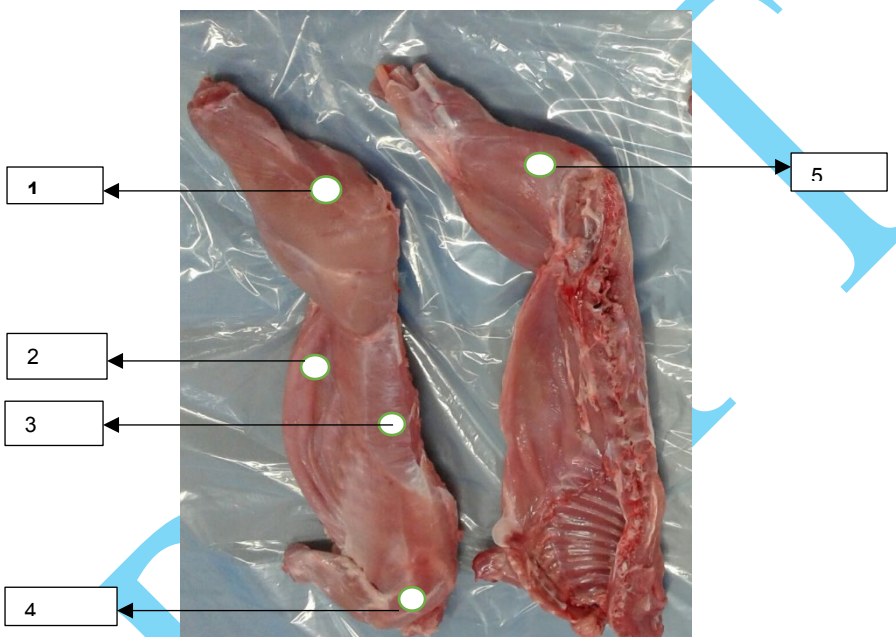
Microbiological sampling sites on crocodile carcasses



**ANNEX 9**

Microbiological sampling sites on rabbit carcasses




1. From base of tail to feet
2. Flank Area midline outside
3. Back or Loin Area
4. Neck area
5. From base of tail to feet