Ministry of Agriculture

Export Abattoirs Inspection and Certification Directorate

Meat Inspectors'

Guidelines for Regulating Export Abattoir Operations

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Acronyms

%	Percent
^{0}C	Degree Celsius
CCP	Critical Control Point
Cm	Centimeter
E. coli	Escherichia coli
ECTAD	Emergency Centre for Transboundary Animal Diseases
FAO	Food and Agriculture Organization of the United Nations
HMS	Hygiene Management System
hrs	Hours
min	Minute
m/s	Meter per second
s/he	She/he
SOP	Standard Operating Procedures
SPS	Sanitary and Phytosanitary
SSOPs	Sanitation Standard Operating Procedures

Figures

Acknowledgements

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Foreword

This technical document entitled “Meat Inspectors’ Guidelines for Regulating Export Abattoir Operations” is one of the documents in a series of Guidelines and Standard Operating Procedures that were developed from 2008 to 2010 by the then Ministry of Agriculture and Rural Development in collaboration with the Ethiopian Sanitary and Phytosanitary and Livestock and Meat Marketing Program.

This Guidelines and Standard Operating Procedures document is at present reviewed and updated by the Ministry of Agriculture in collaboration with the FAO-ECTAD Ethiopia, Improving Sanitary Capacity and Facilitating Export of Livestock and Livestock Products from Ethiopia Project. The main goal of the project is to increase exports of meat and livestock to benefit Ethiopian livestock producers and exporters and to promote national economic development.

The guidelines document is intended to provide professional guidance for meat inspection personnel working at export abattoirs on fundamental principles governing assurance of the safety and quality requirements of fresh meat destined for international markets by outlining step by step operational procedures to be practiced in the meat production establishments.

At this point, the Export Abattoirs Inspection and Certification Directorate of the Ministry of Agriculture would like to thank the FAO-ECTAD Ethiopia, Improving Sanitary Capacity and Facilitating Export of Livestock and Livestock Products from Ethiopia Project, for providing the necessary technical and financial support required for reviewing, updating and publishing this guidelines document.

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1. Introduction

Meat is an important commodity of human diet which needs careful handling throughout the whole production and processing chains. In the process of safe and wholesome meat production, the role-played by the inspection staff in maintaining the health, sanitary and quality standards of the product, through rigorous supervision and control throughout the whole operation of abattoir is very crucial. In this regard, this inspectors and inspector veterinarians' guideline is prepared to serve as a checklist for supervision and control of operational procedures in the export abattoirs.

1.1 Objective

The objective of this guideline is to outline accepted national and international hygienic and sanitary operational procedures that the meat inspectors and inspector veterinarians should follow in ensuring the safety, quality and wholesomeness of meat and meat products produced in export abattoirs.

1.2 Scope

The guideline outlines basic sanitary, hygienic and safety measures that should be applied in export abattoirs with regard to working personnel, slaughter facilities, equipment and tools, abattoir inputs and supplies and over all abattoir operations starting from livestock reception to slaughter, dressing, storage, packaging and dispatch of meat and meat products of cattle, sheep and goats.

While the inspectors and inspector veterinarians may use as a check list to base their daily monitoring and supervision activities in ensuring the level of quality and safety standards that the meat and meat products are required to meet, the operational procedures outlined in this guideline should also be used by the abattoir operators to carry out the day to day operations of the export abattoir.

2. Definition

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

Abattoir operator or management: The person(s) in control of an establishment who is responsible for ensuring that he regulatory meat hygiene requirements are met.

Inedible: Inspected and judged by an inspector veterinarian or meat inspector under his supervision to be unsuitable for human consumption.

Ante-mortem inspection: Any procedure or test conducted by an inspector veterinarian or meat inspector under his supervision on live animals for the purpose of judgement of safety and suitability and disposition

Carcass: The body of an animal after dressing.

Cleaning: refers to the ongoing process of cleaning which takes place throughout the day and reaches its peak after the slaughter process has ended. This process includes the mechanical and chemical methods by which macroscopic and visible dirt is removed. When an object appears to be clean, it is not necessarily free of harmful micro-organisms.

Competent authority: The official authority charged by the government with the control of meat hygiene, including setting and enforcing regulatory meat hygiene requirements.

Condemned: Inspected and judged by an inspector veterinarian or meat inspector under his supervision as being unsafe or unsuitable for human consumption and requiring appropriate disposal.

Contaminant: Any biological or chemical agent, foreign matter, or other substance not intentionally added to meat that may compromise meat safety or suitability.

Dressing: The progressive separation of the body of an animal into a carcass and other edible and inedible parts.

Disinfection: The process or act of destroying pathogenic microorganisms.

Dripping: refers to removal of excess water from carcass following carcass washing.

Evisceration: is the removal of viscera, (internal organs, especially those in the abdominal cavity).

Hygiene: refers to a condition that includes the concepts of “clean” and “safe” (in other words the absence of harmful organisms or substances).

Inspector veterinarian: An official inspector who is professionally qualified as a veterinarian and carries out official meat hygiene activities as specified by the competent Authority.

Meat inspector: An official inspector who is professionally qualified as a mid- level carrier professional and certified to work under the supervision of the veterinary inspector on meat hygiene activities as specified by the competent authority.

Organoleptic inspection: using the senses of sight, touch, taste and smell for identification of diseases and defects.

Offal: The term offal refers to the organ meats of animals: Heart, liver, tongue, kidney, sweetbreads etc.

Red offal: means the lungs, heart, liver, diaphragm, spleen, tongue and demasked head of the slaughtered animal;

Rough offal: means the stomach, intestines, feet

Protective clothing: means special garments intended to prevent the contamination of meat and used as outer wear by persons in an abattoir or establishment, and includes head coverings and footwear.

Poste-mortem inspection: Any procedure or test conducted by an inspector veterinarian or meat inspector under his supervision, on a carcass and other body parts of slaughtered animal for the purpose of judgement of safety and suitability and disposition.

Potable water: means water that is pure and wholesome at the point of usage in accordance with requirements contained in the Ethiopian standard for drinking-water quality.

Sanitation: refers to all processes and principles which are applied to ensure that micro-organism count is kept at a safer or lower level.

Stunning: is the process of rendering animals immobile or unconscious prior to their being slaughtered for food.

Trimming: refers to cutting and taking off contaminated part of a carcass to effectively remove physical debris and bacteria associated with it.

3. Abattoir organization

The meat inspector and inspector veterinarian should ensure that:

- Export meat can only be certified if derived from animals slaughtered in designated and approved establishments.
- The meat production process moves in one direction without any cross flow which may adversely affect the hygiene of the meat product.
- The “Dirty” and “Clean” areas, as indicated below, of the abattoir are clearly separated by distance, physical barriers and in certain cases by time.

3.1 Dirty areas

- Offloading platforms and livestock entrance.
- Vehicle wash bay for trucks that transported animals.
- Lairage where animals are kept until they are slaughtered (shade for sheep and goats).
- Ante-mortem inspection area.
- Isolation lairage for animals that are or might be sick.
- Emergency slaughter facilities for injured animals.
- A post mortem inspection area for animals which arrive dead or die in the lairage.
- Facilities where animals can be restricted and efficiently stunned.
- Bleeding area.
- Facilities where condemned products are handled.
- Areas or rooms where inedible products are handled e.g. hides/pelts, horns, etc. including facilities for sorting grading and weighing.
- Room for the cleaning and sometimes processing of rough offal.
- Disposal of solid waste such as paunch and intestinal contents.
- Chiller or freezer facilities for rough offal.
- Dispatch area for rough offal.
- Effluent pre-purification plant and holding tanks.
- Facilities for the processing of condemned products to by-products such as blood/carcass meal and tallow
- Cloakrooms, toilets, showers, washing facilities
- Store rooms for dirty areas.
- Maintenance workshops.

3.2 Clean areas

- Slaughter hall for the dressing of animals under hygienic conditions with facilities for separating the different components.
- Area for inspection of the carcass and other edible portions in order to determine its fitness for human consumption.
- Facilities for the retention of suspected carcasses which require secondary inspection.
- Grading and weighing areas of carcasses as part of the marketing function.

- Chilling rooms of carcasses to ensure that the quality of the product is maintained and the optimal shelf life ensured.
- Sorting and loading of carcasses in a cooled area to ensure that the cold chain is not broken.
- Dispatch facilities.
- Loading bay for meat trucks.
- Office facilities for meat inspectors and for management.
- Laundry facilities and laboratories.
- Cloakrooms, toilets, showers, wash facilities and dining room where only workers in the clean area have access.
- Store rooms.

The inspector veterinarian should also ensure that:

- An abattoir complies at any time with any condition subject to which a certificate of approval has been issued and with any forthcoming requirement that has been prescribed by importing countries.
- The abattoir management have a schedule showing the ordinary working hours of the abattoir.
- Availability of all the information concerning the number of animals received or slaughtered in the abattoir, or the number of carcasses dressed or otherwise handled therein, or the quantity of meat or animal products processed, packaged or handled for export.
- Taking swift and appropriate measures under his/her authority and report to the Export Abattoirs Inspection and Certification Directorate for any further procedural and legal actions when an approved abattoir has ceased to comply with requirements.
- Ensure the compliance of the provisions outlined under the Export Abattoirs Construction Guidelines" in any maintenance activity that the abattoir may undertake.

4. Sanitary control

Sanitation is the control of environmental influences which may adversely affect the appearance, flavor, shelf life, safety and aesthetic acceptability of meat and meat products. Meat inspectors and inspector veterinarians have the legal and professional responsibility to assure that meat is produced, handled, stored, packed and transported in

a hygienic and sanitary manner. For this, the inspector veterinarian should actively monitor and supervise applications of the following guidelines.

4.1 General sanitation

- Ensure that the abattoir management has a written and acceptable cleaning and sanitation program for the entire premises.
- Ensure that the abattoir managers conduct daily monitoring on implementation of SSOPs, recording the findings and take corrective actions as found necessary.
- Ensure that the abattoir managers arrange relevant training programs for their employees, assign specific duties and monitor their performance.
- Ensure all records, data, checklists, and other information pertaining to the standard sanitary operational procedures are maintained on file and made available to inspection personnel at any time.
- Ensure all equipment are disassembled, cleaned, and sanitized before starting production.
- Perform daily organoleptic sanitation inspection after preoperational equipment cleaning and sanitizing; and ensure the results are recorded on a “Preoperational Sanitation Form"; if found to be acceptable, the appropriate lines are checked and if corrective actions are needed, such actions are taken and documented.
- If the equipment on hand does not pass organoleptic examination, the inspector veterinarian should ensure the cleaning procedure and inspection is repeated.
- Ensure that the hygiene practices and sanitary working habits, handling and cleaning procedures are maintained by abattoir employees’
- Ensure the abattoir managers conduct daily monitoring programs of the sanitation procedures on a regular basis and results are recorded on an Operational Sanitation Form daily.
- In case of sanitation problems, the inspector veterinarian should stop production if necessary and notify the abattoir manager to take appropriate actions required to correct the identified sanitation problems.
- Ensure facilities used for sanitizing invasive equipment (knives, saws, hooks, rods, picks, etc.) are adequate and all equipment are maintained in a sanitary manner at all steps in the dressing procedure.

- Ensure the temperature of hot water sanitizing is always kept at a minimum of 82^0C.
- Ensure abattoir sanitation operations are carried out by trained persons and effective training records are available.
- Ensure abattoir sanitation operations conform to the conditions indicated in "*Guidelines for the construction of export abattoirs and Ante-mortem inspection guidelines".*

4.2 Specific sanitary measures

4.2.1 Employee training and health status

The meat inspector and inspector veterinarian should ensure that:

- All meat handlers have been given appropriate training in personal hygiene and hygienic handling of meat and are given a copy of their work instructions and that they fully understand what is expected of them.
- Persons who come in contact with meat in the course of their work should have a medical examination prior to their employment and regular check up every six months and at other times when necessary.
- No person while known or suspected to be suffering from, or to be a carrier of a disease likely to be transmitted through meat (typhoid, dysentery, salmonella and cholera) or while afflicted with infected wounds, skin infections, sores or with diarrhea is permitted to work in any meat handling area.
- Any person who has a cut or wound should not be allowed to handle meat or meat contact surfaces until the injury is completely protected by a water proof covering which is firmly secured.

4.2.2 Sanitary work habits

The meat inspector and inspector veterinarian should ensure that all meat handlers and abattoir employees are made aware of and comply with the following guidelines while they are in the abattoir premises:

- Use of chewing gum, snuff and tobacco in any form in the meat handling areas should be prohibited.
- Eating and drinking should be confined to the designated lunchroom areas.

- Scratching of the head, face, placing of fingers in or around the mouth or nose, coughing, sneezing and spitting should be avoided. If incase, unavoidably happens, hands or gloved hands (as appropriate) should be cleaned after each episode.
- Rules such as “No Smoking; No Eating, No Nose Fingering etc” should be clearly written and placed in areas where all employees can have a look at it and should be strictly adhered to.
- Hand wash facilities should be used by everyone upon entering the meat production area.
- Hands should always be washed and disinfected immediately, with 100ppm chlorine or 15-ppm iodine solution or liquid soap under running warm water, before commencing work after using the toilet or handling any material, which might be capable of transmitting disease.
- Every person, while on duty on the slaughtering or meat handling area, should wash his hands thoroughly as soon as his hands come in contact with blood or any other dirt with a suitable hand cleaning preparation such as liquid soap under running warm water.
- One should avoid the use of nail polish, hand creams and lotions when handling meat.
- Fingernails should not be excessively long and should be kept clean.
- Cosmetics, false nails or eyelashes and strong perfumes should not be allowed because of the risk of contamination and even tainting of the meat
- Any insecure jewelry or jewelry that cannot be adequately disinfected should be removed from the hands of employees working in the slaughterhouse.
- Jewelry items, which cannot be removed such as continuous loop earrings, wedding bands, bracelets or necklaces, etc. should be adequately covered.
- Items such as pens, pencils, thermometer etc., should not be kept in coat/shirt pockets where they may accidentally fall into products.
- Facial adornments that cannot be removed or are not removed because of any religious or cultural reason have the potential to fall or otherwise contaminate the meat product if they are improperly attached. In view of the fact that these adornments pose a food safety hazard and that it is impracticable to verify if they are

worn securely, they should be either removed or adequately covered when worn in meat preparation and packaging areas.

- Persons handling materials or products capable of contaminating the end product should not come in contact with any end product unless and until they discard all protective clothing worn by them and have changed in to clean protective clothing.

4.2.3 Working apparel

The meat inspectors and inspector veterinarians should ensure that the abattoir management enforce compliance of the following clothing guidelines on its employees:

- Any person entering a meat handling area should wear protective clothing covering at least the head, shoes and any street clothing within the potential meat contact zone (in the majority of cases, only involve a coat that may leave street clothes exposed below the knee), to prevent the transfer of contaminants to meat, equipment and the processing environment.
- All personnel engaged in wet processing areas who are required to handle unprotected meat should wear a clean waterproof covering that covers at least the worker's body to the full extent of the potential meat contact zone, e.g. from the shoulder line to below the lowest point on the carcass in the case of personnel who work with suspended carcasses;
- Staff who may lift beef quarters or sheep and goat carcasses should wear clean protective neck shields, or hooded overalls.
- Protective clothing should fit reasonably well, for example, coats that are too small may not cover outer clothing properly, and clothing or footwear that is the wrong size may limit movement and lead to accidents.
- Protective clothing designed to avoid contamination of the meat product should preferably be light colored so that contamination is easily seen but livestock handlers should wear suitably dark clothing to prevent animals from being distracted.
- Personnel engaged in activities of a similar hygienic status should wear protective clothing of the same color that will allow presence of any soil or dirt is clearly distinguishable.

- Protective clothing should be provided in such a number as to be sufficient for the abattoir employees and meat inspectors for changing every day and some more spare protective clothing that are to be used for visitors.
- All persons working or entering areas where meat products are open to exposure should wear appropriate head coverings. The head coverings should cover all exposed hair.
- Non-disposable protective clothing such as overalls, gowns, aprons, head coverings, and foot wears should be made of such material as to render them easily cleaned and durable enough to stand frequent washing at high temperatures.
- Disposable protective clothing should be sufficiently robust to afford the required level of protection.
- All personnel who are required to handle unprotected meat should wear footwear that can be effectively cleaned before entering any meat handling area.
- The boots to be used in the dressing and other meat handling areas of the abattoir should be of a material impervious to moisture and should be of a color distinct from other footwear and these boots should be worn only at the workrooms.
- Other footwear should be utilized when walking to and from the workstation.
- Gloves may be worn by all personnel engaged in handling unprotected meat product.
- Gloves should be cleaned before use and whenever they become visibly contaminated.
- Hands should be cleaned before gloves are donned and after gloves are removed.
- Work clothing that may contact meat products should be suitably washed, ironed (other than boots and aprons) and maintained.
- Work clothing should not be worn or stored in incompatible areas (washrooms, lunchrooms, lockers used for street clothing, outside the abattoir, etc.).
- Meat handlers should change their protective clothing if it becomes excessively soiled
- Each set of protective clothing should be washed and ironed at the end of the day's operation.
- Those types of protective clothing such as aprons and foot wears should be washed by hand held sprays as soon as contaminated by blood or gut contents.

- If any hand tools and equipment such as knives are found contaminated with blood, gut content or any dirt matter during slaughtering, flaying and other subsequent operations, they should be sanitized (washed in a sanitizing solution such as a 2oo ppm chlorine solution or in hot water of 82^{o}c for two minutes and rinse them in water) before proceeding to the next activity.
- At the end of operations, work clothing and equipment such as knives, hooks, steels, mesh gloves, etc should be cleaned and sanitized and be available for a pre-operational inspection.
- Hand tools such as knives used to slaughter or dress one animal or a carcass should be washed before re-using it for slaughtering any other animal or dressing a carcass.
- Gloves used in the handling of meat products, should be maintained in a clean and sanitary condition by washing with hot detergent (soap) solution and rinsed with water.

4.2.4 Visitors, vehicles and animals

The meat inspectors and inspector veterinarians should ensure that the abattoir management enforces the following guidelines on visitors and other animals:

- Unauthorized personnel and vehicles, non-slaughter animals such as dogs and cats, wild birds and vermin should be kept out of the abattoir compound.
- Visitors should be supplied with protective clothing before letting them have access to the abattoir operational premises.

4.2.5 Building and equipment maintenance

When maintenance of the abattoir is required the abattoir management should do with prior consultation and close supervision of the inspector and inspector veterinarian for its adequacy and approval of the type of replacement (maintenance) materials to be used with regard to meat safety. It should be checked that the newly replacement equipment or materials are free from heavy metals such as lead and others prohibited under the Export Abattoirs Construction Guidelines.

4.3 Sanitation program

The inspector and inspector veterinarian should enable the abattoir management to have a written cleaning and sanitation program for the entire premises indicating areas to be cleaned, method of cleaning to achieve the required efficiency, personnel responsible and

frequency of activity. The abattoir management should own the responsibility of monitoring the activity. The inspector veterinarian should carry out a pre-operational inspection for effectiveness of the sanitation program to ensure that slaughter operations begin only after sanitation requirements have been met.

4.4 Cleaning

Good hygiene demands effective and regular cleaning of abattoir's equipment and vehicles to remove meat residues and dirt, which may contain meat poisoning and spoilage microorganisms. Water used for cleaning, hand washing and carcass spraying should be of a potable quality. Detergents should have good wetting capacity and rinsing property, be non- corrosive and compatible with other materials including disinfectants used in the sanitation program.

Cleaning operations should include areas such as lairages, stunning & bleeding chambers, slaughter hall, de-boning area, refrigeration and meat preparation area, offal and hide rooms, boiler room, toilets, service areas, and all types of equipment. Inspectors and inspector veterinarians should monitor and supervise implementation of the general and specific abattoir cleaning and disinfection procedures as well as storage of equipment are in line with the guidelines indicated below.

4.5 General cleaning procedures

Cleaning procedures should include, but not limited to, the following:

- Removal of loose bits of rubbish such as meat, fat, skin and bone from equipment walls and floors to facilitate cleaning.
- Loosening pieces of rubbish, blood, faecal and other contaminants by means of dry sweeping, and removing them by picking them up. Bits of meat and fat and skin, in particular, should not be washed into the drainage system.
- Washing all equipment, floors and walls with clean hot water (40 - 50°C) to soften and loosen the remaining particles.
- Washing and scrubbing with detergents and hot water under pressure.
- Rinsing with clean hot water (45°C) under pressure in order to remove the loosened particles and detergents properly.
- Disinfecting with a suitable disinfectant at the proper concentration (daily or weekly as may be required).

4.5.1 Cleaning during working hours

- During routine operations, feet, hides and skins, offal, waste scraps, condemned carcass or parts should be removed immediately from the slaughter floor and transferred to their respective designated areas.
- Garbage found anywhere in the abattoir compound should be collected during and after working hours and disposed of to the designated waste disposal area at least once daily.
- Obsolete equipment should be removed from production areas.
- During work break hours cleaning of floors by using cold-water spraying can be done but has to be done with great care to avoid the splashing of carcass and offal.
- Any hand tools such as knives, hooks, saws, etc., which are used for bleeding, ripping, head and feet removal, skinning, carcass dressing, inspection, etc., should be sanitized by immersing in a tank of water at a temperature of 80-82^{o}c for two minutes or in a 200ppm chlorine solution and then rinsed with hot water after being contaminated with dirt matter and/ or using them for one animal or carcass and before reusing them.
- Those types of protective clothing such as aprons and foot wears should be washed by hand held sprays as soon as contaminated by blood or gut contents
- Immediately after disposal any container coming in to contact with condemned and inedible products should be cleaned & disinfected in a similar manner.

4.5.2 Cleaning after working hours

- Dry cleaning (removal of the top and gross dirt particles without using water) should be done immediately after completions of slaughtering operations have ceased. This should embrace the whole premises including the holding pens and lairages.
- After dry cleaning is completed detergent solution is applied on the surface of the area (walls, floors, surfaces of stationary equipment, etc.) to be cleaned and the equipment and hand tools are immersed in the hot water detergent solution to loosen soil and bacterial films and holding them in solution or suspension

- Removal of soil and gross dirt matter by scrubbing from the surface of the walls, floors and equipment and hand tools in the presence of detergent solution
- Rinsing with hot water should be applied under 14kgf/cm2 pressure and 82^{o}c temperature. Conveyors, chutes and other types of equipment should be cleaned in a similar manner
- All work (protective) clothing such as aprons, boots, overall, gowns etc. should be cleaned by using a hot detergent water solution and final cold-water rinse, followed by drying and ironing (except boots and aprons) after the end of the day's operation

4.5.3. **Cleaning and disinfection at weekly intervals**

A more through weekly use of detergents and sanitizers is necessary for areas such as the killing floor; detain room, head room, casing and cleaning room, offal preparation room, meat cutting and boning room, condemned and inedible room. Different types of cleaning and disinfection methods in combination or alone can be utilized (see annex II) as required. The commonly used method being:

- For small item of equipment such as knives, hooks, saws, trays and others, soaking in a detergent solution in a separate receptacle is necessary to loosen the dirt prior to scrubbing.
- Removal of soil and gross dirt matter by scrubbing from the surface of the walls, floors and equipment in the presence of detergent solution
- Application of detergent on the surfaces of areas and stationery equipment in the form of foam, which is allowed to remain for up to 15-20 minutes and then rinsed off with a hot water (80-82^{o}c) spray.
- Removable parts of machinery and smaller items of equipment should be submerged in a tank of water at a temperature of 80-82^{o}c for two minutes.

4.6. Specific cleaning procedures

4.6.1. Lairage and holding pens

- At the end of each day's operation, gross debris, dirt and faecal matter should be removed and followed by washing down of floors, walls and partitions using high pressure (14Kgf/cm^{2}) cold-water spray.

- At monthly interval partitions, walls or tubular fittings will require scrubbing with a stiff brush or scraper.

4.6.2 Slaughter hall and accessory departments

- In areas in which carcasses and meat are handled, cold water at low pressure should be used constantly during working hours to remove dirt from the floor and some fixed equipment and to clean operators boots and aprons when contaminated while at work.
- Cleaning using high-pressure hot water (14kgf/ cm^2 pressure at the nozzle and 82^oc temperature) should be used at break hours and at the end of the day's kill.
- When stationary equipment is cleaned, meat products should be removed from the room or area.
- For effective cleaning of equipment such as pipe runs, in place cleaning (cleaning without dismantling) with water and detergent solution having a minimum fluid velocity of 1.5 meters per second (5 feet per second) with turbulent flow is required. If it cannot be cleaned satisfactorily by this method, the parts should be dismantled and cleaned by immersing in a hot water detergent solution.
- All mobile equipment and equipment which can be dismantled should be moved to cleaning and sterilization room for cleaning together with other smaller hand tools such as knives, hooks, cleavers (saws), trays and others after the end of the day's operation by immersing in batches in tanks containing hot detergent solution for two minutes and final washing by hot water (82^oc) rinses.
- Hot water jet hoses can be used to clean certain types of equipment such as offal racks, containers etc.
- All equipment, which has come in contact with contaminated material or condemned product, should be washed by immersing in sanitizing chlorine water solution of 200ppm or hot water detergent solution of 82^oc for two minutes and final hot water rinse before reuse.
- All hand tools (equipment) such as knives etc. which are used to bleed, skin, dress, inspect etc. one animal or carcass should be washed clean and sanitized by immersing in a sanitizing chlorine water solution of 200 ppm or hot water detergent solution of

82^{o}c for two minutes and then rinsed with hot water before reusing them for the next animal or carcass.

- Those types of protective clothing such as aprons and foot wears should be washed by hand held sprays as soon as contaminated by blood or gut contents
- All protective clothing such as aprons, boots, overall, gowns etc. should be cleaned by using a hot detergent water solution and final cold-water rinse, followed by drying and ironing (except for boots and aprons) after the end of the day's operation.

4.6.3 Chillers and freezers

- Chillers should be sanitized before a fresh load of carcasses or products are loaded.
- Chillers may not be sanitized if it contains meat.
- Freezers should be defrosted and thoroughly sanitized at least once a year or more often if required by the authorized person.

4.6.4 Changing rooms and toilets

Changing facilities and toilets should be kept clean at all times and a routine cleaning and disinfection procedure should be conducted during work hours and after the day's operation is finalized.

4.6.5 Condemned and inedible product room

Sanitary conditions should be maintained at all times in the condemned and inedible rooms by applying daily cleanup activities as follows:

- Remove gross debris
- Apply detergent solution on the surface of the area to be cleaned and submerge the equipment and hand tools in the water detergent solution
- Remove soil and gross dirt matter by scrubbing from the surface of the walls, floors and equipment and hand tools in the presence of detergent solution.
- Sterilize equipment after the completion of the day's operation by immersing in batches in tanks containing hot detergent solution or 200 ppm chlorine solution for two minutes and final washing by hot water (82^{o}c) rinses and the rooms with hot water sprays (82^{o}c).

A more through weekly cleaning and disinfecting programs should be practiced as indicated above. Condemned products holding containers should be thoroughly cleaned and sanitized (by immersing in 200 ppm chlorine or hot water detergent solution for two minutes and rinsing in hot water (82^{o}c)) after discharge of the material in the condemned area before they are returned to an edible area.

4.6.6 Abattoir campus

- Roadways and yards in the immediate vicinity of the slaughter hall and serving premises such as lunchrooms should always be kept clean and free from any objectionable odor.
- Any garbage material should be immediately collected and disposed of to the designated waste disposal area at least daily.
- The manure should be collected and bayed near the lairage every day on the dirty side of the compound and transported out of the abattoir at least once a week.

4.6.7 Vehicles

- Meat transport vehicles should be washed clean as soon as they enter to the gate of the abattoir by using high-pressure hot water detergent solution spray and rinsed by hot water.
- Livestock transport vehicles should also be washed clean as soon as they enter to the gate of the abattoir by using high-pressure cold-water spray.

4.7 Drying after cleaning

- Equipment should be left dry as soon as possible after cleaning by air-drying or by use of non- reusable tissue or absorbent materials.
- Adequate drainage points should be provided in equipment that cannot be dismantled and drying racks provided for small pieces.
- Any equipment that unavoidably remains wet for a period during which significant microbial growth might occur should be disinfected (by hot water hosing at 82^{o}c for two minutes) immediately before use.

4.8 Equipment and clothing storage

- All knives, scabbards, steels, hooks, and other tools used by employees, as well as their work clothing such as aprons, are to be considered as an integral part of abattoir equipment and should be maintained as such and stored on rust-resistant racks or multiple scabbards, and not in clothes lockers.
- If locker storage for personal tools of employees is used, the facilities should be separate from those used for clothing
- Work clothing should not be worn or stored in incompatible areas (washrooms, lunchrooms, outside the abattoir, etc.).
- Packaging material should be stored and used in a clean and sanitary manner and should not be accessed by rodents, insects and contaminated by toxic chemicals and other materials.

4.9 Equipment

Inspectors and inspector veterinarians should ensure the following guidelines are considered in the purchase of abattoir equipment to be used for the production of meat:

- Meat contact surfaces of equipment should be constructed with materials that are, smooth; non-corrosive; rust-resistant; non-toxic; non-absorbent; and durable enough to withstand repeated cycles of cleaning and sanitizing.
- Materials that are not acceptable for equipment that has contact with edible meat products include copper; cadmium; lead; corroded metals; equipment with painted surfaces; containers or equipment made of enamel ware or porcelain used for handling and processing meat products; and wood, dry-wall, plasterboard, or porous acoustic-type boards on any exposed surface that is not appropriately sealed.
- Equipment made of stainless steel and easy to clean are recommended.
- Equipment constructed by use of metal over wood should not be purchased since the wood material is difficult to clean.
- Softwood floor racks and pallets are permitted only in dry storages.
- The use of wood in meat production and handling areas is prohibited for purposes other than those mentioned above.

- Metal brushes or steel wool should not be used, because they damage the surface of the equipment; this makes proper cleaning and disinfection difficult.
- Cloths may not be used for drying as this only spreads contamination.
- Aluminum may pit and corrode when exposed to certain chemicals. When friction occurs between aluminum and meat or fat, a black oxide is produced which discolors the meat. The use of aluminum is therefore should be limited to applications where the metal does not directly contact the meat.
- Portable equipment used for the collection, holding and transfer of condemned and other inedible material should be of rust-resistant metal and be watertight. These equipment should be distinctly and uniformly marked for easy identification either by color or the word condemned and inedible.
- Painted racks are not suitable for use in a high moisture area since they are subject to chipping and thus resulting in corrosion. However, painted racks can be used for packaged or boxed products in dry storages or freezer areas.

4.10. Vermin (pest) control

Vermin (pest) are capable of introducing serious human diseases through meat products. There should be an effective and continuous program for the control of pests. Pest control programs should not compromise the safety of the meat products and working personnel. Inspector veterinarians have the responsibility of ensuring implementation of regular abattoir pest control programs in line with accepted guidelines and procedures indicated below and should not endanger the safety of meat produced or health of employees.

4.10.1 Insects

Excellent housekeeping program, along with the use of screens, air curtains, and electrical insect control devices and elimination of all places where the insects can breed and hide are the first steps in avoiding the introduction of insects and rodents.

Insecticides may be residual or non-residual. They may take the form of aerosols, sprays, powders, pellets, repellents or gases.

- Insecticides should only be used if other precautionary measures cannot be effectively used.

- Each insecticide should be specifically formulated for designated use and places with the full awareness of the inspection staff for any potential restrictions for their use or application.
- Before insecticides application, care should be taken to safeguard all meat, equipment and utensils from contamination.
- After application, contaminated equipment and utensils with insecticides should be thoroughly cleaned prior to using them again.
- The insecticides and rodenticides that are applied should be restricted only to those listed by the Export Quarantine Inspection and Certification Directorate to be used in the export abattoirs.

4.10.2 Rodents

Rodent control is facilitated by the elimination of rodent harborages in surrounding areas as well as in the abattoir through the elimination of food supply for rodents or, the destruction of rodents. Rodent destruction can be performed either by the use of traps or by use of poisons. Traps can be used in areas where the use of rodenticides may be hazardous and where there is light infestation. They should be checked at least every 24 hours.

In using rodenticides, the following guidelines should be followed:

- The bait stations (paces where the rodenticides are placed) should be identified and adequately supervised by the inspection staff.
- All bait stations should have a cover and should be removed from edible product rooms and areas before the commencement of operations.
- Only licensed pest control operators or designated abattoir employees, personnel who have a thorough understanding of the potential hazards to health resulting from the use of these agents, under adequate inspection control, should prepare and use such materials.
- Pesticides and other hazardous substances should be suitably labeled with warning about their toxicity and use.

4.11 Disposal of waste products

Storage of manure, paunch and viscera contents in the vicinity of the export abattoir is not acceptable. They should be removed from the slaughter hall as soon as they are recovered from the animal or emptied from visceral organs and transported to designated waste disposal areas during or after working hours without creating any objectionable odor and serving as a breeding place for insects.

4.12 Pre-operational checks

Slaughter should not commence before all areas, rooms and equipment have been cleaned and disinfected. In order to check up on the effectiveness of the cleaning and disinfection processes, it is very important to inspect the slaughter floors and equipment first thing in the morning. If there are any problems, there is still time to re-clean properly before slaughtering begins.

A visual inspection of the abattoir and equipment will reveal immediately any traces of meat, fat, blood and other contaminants that have not been removed. These remnants are highly undesirable, as they attract insects and rodents while also serving as an excellent growth medium for bacteria. During inspection the senses of smell, sight and touch are employed. Odors in an abattoir can give a good indication of whether the cleaning and disinfection processes have been carried out properly.

While bad odors such as rotting meat immediately indicates ineffective cleaning procedures, an excessive smell of chemicals is also undesirable, as it can easily mask bad odors, and meat is also well known for its ability to absorb odors. Important information can also be obtained from touching surfaces, especially those that are not easy to see. Greasy surfaces, dust, splits and cracks can be traced in this way.

5. Pre-slaughter operations

5.1 Stock reception and handling

The welfare and safety measures outlined in the Livestock Handling and Transport Guidelines apply to the pre-slaughter livestock handling operations of the export abattoirs. Meat inspectors should supervise application of measures including the following guidelines for the reception and handling livestock before slaughter:

- Ensure livestock reception is carried out in the presence of competent abattoir livestock handler, who is capable of receiving travel documents and keep appropriate records on each and every batch of animals received.
- Make sure animals coming should be unloaded by using a platform alongside the truck reception point as soon as possible after arrival.
- Ensure the completeness and authenticity of the information indicated in the livestock travel documents accompanying the animals before allowing them to be unloaded within the abattoir premises.
- Check all journey plans and log books of livestock trucks and keep appropriate records on each and every batch of animals received.
- Observe the health and welfare status of animals while on truck, during unloading and while being moved to the holding pens for signs of disease, welfare problems or presence of excessive dirt.
- Seriously injured or terminally sick animals that may require immediate slaughter, should be identified and killed humanely without delay.
- Make sure animals should be permitted to quietly walk off the transport vehicle to minimize the risk of injury or stress and move to their respective holding pens to rest for 72 hours. However, the resting period for animals coming from recognized feedlot facilities and farms found within about 100 kms radius from the slaughter abattoirs, may be shortened up to 24 hours depending on their physical conditions.
- As far as possible, established groups of animals should be kept together and each animal should have enough space to stand up, lie down and turn around.
- Depending on the size of the animals and the duration of time that the animals should be provided flor areas as indicated below:
    - In holding pens, the penning floor area should not be less than 3.25 m^2 for each adult bovine and 0.55 m^2 for sheep and goats. For camel, 100 m^2 for one camel plus 50 m^2 for each additional camel may be required.
    - The minimum lairage area should not be less than 1.8 m^2 per head of cattle, 2 m^2 for camel and 0.55 m^2 per head of sheep and goat.
- Animals hostile to each other should be penned separately.

- The holding pen and lairage area should be well lit in order to enable the animals to see clearly without being dazzled. During the night, the lights should be dimmed. Lighting should also be adequate to permit inspection of all animals.
- Mixing of different species of animals or unfamiliar groups of the same species should be avoided, as this will cause disturbance among them.
- Aggressive horned animals should be penned separately.
- Fractious animals should not be penned with other animals.
- Where tethers, ties or individual stalls are used, they should allow animals to stand up and lie down without causing injury or distress.
- Where bedding is provided, it should be maintained in a condition that minimizes risks to the health and safety of the animals, and sufficient bedding should be used so that animals do not become soiled with manure.
- Bedding for camels should consist of generous layer of hay, straw or sand as camels should spend as little time as possible on hard surfaces that can cause injury to foot pads, or that wear the pedestal and kneeling pads of the animal.
- Animals should be kept securely in holding pens and in the lairage, and care should be taken to prevent them from escaping and from predators.
- Potable drinking water and feed should always be provided to all animals kept in holding pens, including those kept in the isolation or suspect pens while water supply should also continue for those animals transferred to lairages as well. But if animals are to be slaughtered using halal slaughter methods, feed also be provided for animals kept in lairages.
- The condition and health of animals in holding pens should pass through the health screening process known as “initial antemortem inspection” by a meat inspector once every day until final antemortem inspections is carried out in lairages within 12 hours before slaughter.
- Animals which are sick, weak, injured or showing visible signs of distress should be separated, and veterinary advice should be sought immediately regarding treatment or the animals should be humanely killed immediately if necessary.

- Move animals that appear, alert, calm and without signs of disease to lairages after completing the 72 hours rest period to stay there for additional 12 hours for conducting final antemortem inspection.
- No animal should be kept in a holding pens awaiting slaughter for a period exceeding 72 hours unless extension of these periods is authorized in special circumstances by the veterinarian.

5.2 Ante mortem inspection

Ante-mortem inspection consists of examining the live animals, separating those which appear abnormal or diseased and, passing the rest for slaughter. Ante-mortem inspection is included as an integral component of a risk-based system for the production of meat by incorporating relevant information while inspecting each animal, e.g. geographical region and origin of animals. In the absence of a risk-based system, procedures are based on current scientific knowledge and practice.

The specific guidelines outlined in the Ante-Mortem Inspection Guidelines for Export Abattoirs should be followed. The inspectors and inspector veterinarians should ensure implementation of measures including, but not limited to, the following:

- Meat inspectors should conduct initial ante- mortem inspection of animals as soon as their arrival while animals are on truck, while animals are being unloaded, while moving to holding pens, once every day while animals are being kept in holding pens and a final ante- mortem inspection 12 hours before slaughter while animals are being kept in the lairages.
- Inspection includes confirmation that the animals are properly identified, so that any special conditions pertaining to their sources are considered in the post-mortem inspection.
- No animal which has entered the holding pens or lairage shall be removed from there, whether for slaughter or otherwise, unless permission has been granted by the inspecting officer.
- Animals presented for ante-mortem inspection should have passed the required drug withdrawal period if they were treated for any sort of systemic illness before they were sent to the holding pens and lairage.

- All animals presented for slaughter are subjected to ante-mortem inspection on an individual or a lot basis and all records should be properly recorded and kept.
- Animals suspected as being unsafe or unsuitable for human consumption are identified and handled separately from normal animals in a manner that does not result in cross-contamination of other animals with food-borne hazards.
- Dead and condemned animals to be destroyed during ant-mortem inspection should not be allowed to go to the clean area of the abattoir.
- If there is a suspicion of trade limiting diseases on ante-mortem inspection, the animals should be held in isolation, laboratory samples are collected for confirmation and an appropriate and disease specific disposal and decontamination measures are applied.
- Results of ante-mortem inspection should be made available to the competent person undertaking post-mortem inspection before carcasses are examined at the postmortem inspection point so as to augment final judgment.
- All the reasons for condemnation should be recorded, with confirmatory laboratory tests being carried out if deemed necessary.
- The number of animals that the meat inspector inspects within 24 hours should not exceed 100 adult cattle, or 200 calves, or 700 sheep and goats.
- During ante-mortem inspection, the slaughter of a suspected animal of being infected with disease likely to contaminate other meat is conducted in an emergency slaughter place.
- No person employed for the time being in an emergency slaughter place enters any edible product department.
- All equipment, fittings, utensils and protective clothing used in an emergency slaughter room or place are strictly used for no other purpose and, after being sterilized, are kept in the emergency slaughter room or place or in a place reserved for this purpose.

5.3 Moving livestock to the slaughter hall

The inspector veterinarian should ensure the slaughter animals movement to slaughter hall be based on the procedures outlined in the "Livestock Handling and Transport Guidelines". The guidelines to follow should include the following:

- Moving of animals to the slaughter hall should be carried out by a trained person with the minimum of excitement of the animals.
- Animals with extremely wide horns or pronounced lameness should not be introduced in to the lead-up race unless they are able to move freely along the race.
- Animals dislike going from light to dark and will avoid shadows so that gaps under doors should be avoided.
- Sticks, metal pipes, or pointed objects should not be used for moving livestock. Canvas or leather flappers, soft polythene pipes and rattles are recommended.
- Gates should not be used for forcing an animal along races.

5.4 Stunning

If animals are to be slaughtered by using religious slaughter methods such as Halal (a slaughter method practiced based on Muslim religion teachings), stunning practices may not be required or the stunning methods that will not lead to the death of the animal (reversible stunning methods such as by using mushroom bolt stunning gun) can be used. But for animals that are to be slaughtered using non-religious or non-halal methods, the inspector veterinarian should ensure that animals be stunned incompliance with the procedures outlined in the “Livestock Handling and Transport Guidelines”.

- No animal should be stunned, slaughtered or dressed in an abattoir unless the meat inspector is present.
- Stunning should be carried out in a manner that animals do not regain consciousness while being slaughtered,
- The equipment used for stunning should be maintained and operated properly in accordance with the manufacturer's recommendations, in particular with regard to the species and size of the animal and should be applied correctly.
- Backup stunning devices are to be available for immediate use if the primary method of stunning fails.
- There should be no more than one animal in stunning box at each time and animals are not left in stunning box during breaks.
- At the time of stunning, animals should be adequately restrained
- The head of each animal confined in a stunning box should be securely fastened to enable the animal be stunned with little pain

- The stunning operation should be carried out by a trained person.
- Each animal should be stunned and subsequently bled before each operator moves to the next animal.
- animals should not be stunned when slaughter is likely to be delayed;
- If the animal regains consciousness it should be re-stunned before being slaughtered.

The following methods can be used for stunning animals:

- Camels over six months old — firearm or captive bolt can be used in stunning camels by the poll or frontal methods as indicated below. Trained camels should be sat down before stunning. For mature bull camels and especially bulls in rut, the captive bolt, if used, should only be applied to the poll position as bulls in rut develop thick glands at the top of the head that prevent the effective use of the captive bolt by the frontal method.

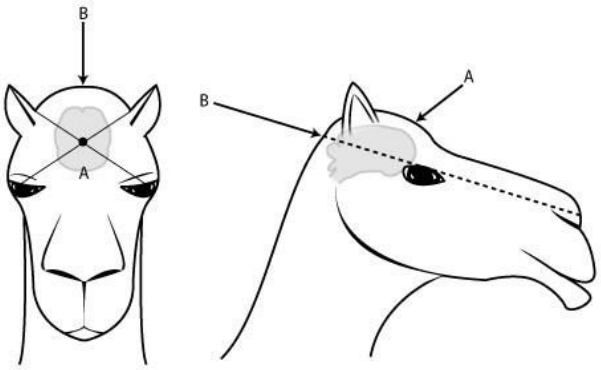


Fig 1. Camel stunning points (poll and frontal methods) of the captive bolt method

- To stun adult cattle — firearms or captive bolt can be used. The frontal position should be employed. This is the intersection of imaginary lines connecting the outer canthus of each eye with the opposite ear. People who use a captive bolt pistol for stunning cattle should know where to stand. The operator should never stand in front of the animal, as it will jerk its head away when the pistol is aimed. The best position for the operator is just behind the animal's head. When it looks up, the pistol can be quickly brought into position and fired. A light above the stunning box encourages the animals to look up.

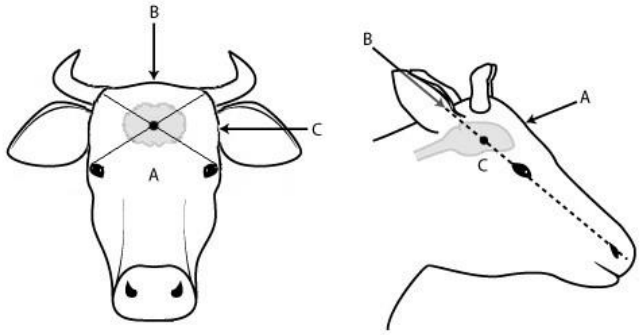
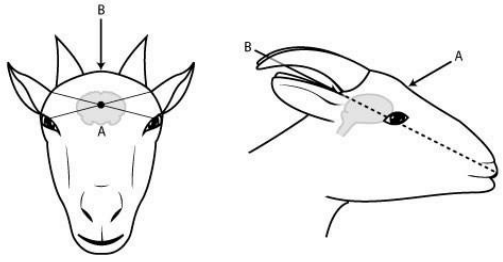


Fig. 2: Stunning points for horned cattle of the captive bolt method

- For goats and sheep over six months old — firearm, captive bolt or bleeding-out can be used. A shot aimed at the crown of the head and pointing straight down should be used in preference to the poll position. Where the poll position should be used because of the presence of horns, the shot should be placed immediately behind the base of the horns and aimed towards the mouth.
- Alternatively, a low voltage alternating electric current can be applied by means of two electrodes to stun sheep or goats.
- Using mushroom bolt stunning gun, unconsciousness is achieved through percussion by strong blow to the skull. The brain is not penetrated, and as the animal is not killed, it is a method that is acceptable in many countries for Halal slaughter.

Fig. 3: Stunning points for goats of the captive bolt method



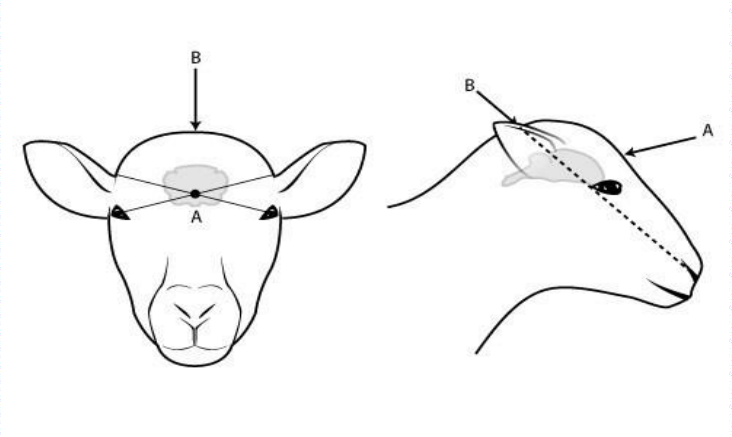


Fig. 4: Stunning points for sheep of the captive bolt method

6. Slaughter and dressing operations

The inspector veterinarian should ensure animal welfare and sanitary measures taken during slaughter and dressing operations are in compliant with the procedures outlined in "Livestock Handling and Transport Guidelines" and "Export Abattoirs Construction Guidelines". The guidelines that should be followed in the slaughter and dressing operations should include, but not limited to, the following:

6.1 General dressing requirements

- No dressing procedure shall begin if there is any potential return to or signs of, a return to consciousness.
- Carcasses should be dressed after being suspended by the hind legs.
- The identity of the carcass and all its parts should be maintained throughout the dressing process and until the post mortem inspection and disposition are completed.
- Any contaminated area on the carcass or its parts should be trimmed out. Washing is not sufficient for the removal of visible contamination.
- No person removes any serous membrane from any carcass, or removes, modifies, or obliterates any evidence of disease or defect in any carcass by washing, scraping, stripping, or in any other manner before examination.
- Pathological lesions should not be removed until the post mortem inspection is completed.

- From the bleeding area to the last point of inspection, carcasses should be spaced so that un-skinned carcasses do not come into contact with any other carcass, carcass parts, floors, walls or other structures.
- No person in an abattoir commences to process or otherwise deal with a carcass or meat intended for human consumption or remove offal or viscera from the viscera table until it has been inspected and given permission by the inspector.
- No person applies to any carcass, meat or animal product any insecticide or antibiotic substance, or any substance which is intended to prevent the spoilage of the carcass, meat or animal product by inhibiting the activities of insects, or by preventing the development of bacteria or mould, or for any purpose.
- Under no circumstance, skinning, evisceration and other preparation of animals condemned on ante-mortem inspection, or found dead, is done on the killing floor but should be carried out in a special area reserved for that purpose.

6.2 Slaughter

- All animals should either be instantaneously slaughtered or stunned by means of instruments capable of instantaneously rendering the animal insensible to pain until death supervenes.
- The slaughtering operation should be carried out by trained personnel and should apply correct shackling and hoisting procedures.
- Stunning procedure renders the animal unconscious for only a very short period of time and that bleed-out should be achieved whilst the animal is insensitive to pain and before it begins to recover consciousness.
- An animal should be slaughtered within 60 seconds after stunning
- In stunned animals, they should be promptly shackled, hoisted and conveyed to a properly constructed bleeding area, and then bled or slaughtered.
- In animals slaughtered without stunning, slaughtering should be done on a bleeding table instantaneously and the carcass is then shackled and hoisted.
- Animals should not be allowed to suffer unnecessary pain and should be slaughtered without delay.

- The non-ritual slaughter method involves cutting the throat and bleeding to death.
- Cutting both carotid arteries and jugular veins results in brain failure with consequent unconsciousness, but when only one carotid artery is cut brain failure will not occur within approximately seventy seconds. If the carotids are missed altogether and only the jugulars are cut the animal can take as long as five minutes to die. Therefore, the aim should be to ensure that both carotid arteries and jugular veins are cut and separated as expeditiously and physically as possible.
- No animal should be slaughtered in the sight of any other animal awaiting slaughter.
- Sufficient space and time should be made available for bleeding so that blood will be confined to the bleeding area.
- Knives should be sharp and two knife systems are in use and sterilizer temperature records are available at all times
- knives should not be wiped “clean” on hides, pelts or cloths, they should not be laid on floor, hand washbasins or platforms but instead knives should be frequently washed and sterilized.
- The slaughtering knives should be adequately rinsed and sanitized between each animal. Heat causes blood to coagulate, so the knife should be rinsed with cold water before it is placed in the sterilizer.
- Blood intended for edible purposes should be collected without contamination
- The slaughter man should allow sufficient amount of time for bleeding that dressing operations should not start before the death of each animal (a common problem is that heads and front feet are removed while the animal is still bleeding).
- After the animal is being slaughtered, bleeding should normally continue for at least 6-8 minutes for cattle and 3-4 minutes for sheep and goats. If shorter periods are allowed, blood will drip on the dressing floor, causing contamination in this work area.
- Blood should not be allowed to enter to the drainage system but should be collected in a bleeding trough.
- Immediately after slaughter and before head is removed, numbered tags should be placed on each head and carcass of the slaughtered animal.

- No person commences to dress a slaughtered animal until the flow of blood has ceased and life is extinct.

In cases of Halal slaughter, bleeding with reversible stunning or without prior stunning is practiced. Halal slaughter requirements include, but not limited to, the following:

- The slaughtering should be done manually using a stainless-steel knife.
- The throat should be cut with knife with one stroke only.
- The slaughter man should severe the respiratory tract, esophagus and jugular vein as close as possible to the head.
- The slaughter knife should be sanitized and rinsed before proceeding to the next animal.
- Operators should wash their hands and arms in a nearby located hand washing basin after slaughtering each animal.
- The animal should be completely dead before subsequent operations take place
- Where no stunning is carried out the animal should not be moved until all brain reflexes have ceased

6.3 **Esophagus rodding and tying**

The inspector should make sure that:

- The esophagus of slaughtered animals is removed through the diaphragm and thoracic cavity without rupture, by separating the esophagus from the trachea, lungs and surrounding tissue by rodding instrument and effectively tied before evisceration.
- Rodding and tying instruments are cleaned and sterilized after each use.

6.4 Head removal

The inspector should supervise and ensure that the following guidelines are followed during head removal operations.

- The heads should be removed from the carcass in such a manner to avoid soiling them with rumen contents (this can usually be accomplished by tying the esophagus and then pulling the head sharply to the side as the gullet is cut.
- There should be no contamination of heads or other skinned areas of the neck by coming in contact with other heads and carcasses, the floor, or fixed objects.

- ❖ Removed heads should be taken to the headroom and hanged by their mandible.
- ❖ The employee who removes heads should wash his hands and sanitize his knives after each head removal.
- ❖ The head skinner should clean and sanitize his knife as frequently as necessary.
- ❖ Prior to washing, the horns, all pieces of hide, and eardrums should be removed from each head and the equipment used for holding heads for trimming and dehorning is cleaned between each head (disinfection is required after use on each suspect, retained, or other obviously diseased animal).
- ❖ The washing of heads should be done in compartments or areas that will control the splash of wastewater to prevent contamination of other heads or adjacent carcasses.
- ❖ The oral and both nasal cavities should be thoroughly flushed before washing the outer surfaces of each head; and each head is also free of all hair and other contamination prior to inspection.
- ❖ The equipment and facilities used for head removal operations should be in compliant with the guidelines indicated in the “Export Abattoirs Construction Guidelines”.

6.5 Ripping

- ❖ The removal of the hide or skin begins by making cutting (ripping) lines by using a sharp tipped and straight bladed knife.
- ❖ The skin should be cut from inside out to prevent carcass contamination with hair and dirt.
- ❖ Knives should be rinsed clean after ripping and before proceeding to the next operations.

6.6 Feet removal

- Feet removal starts by skinning the area above and below the carpal and tarsal joints and making circular incisions around these joints
- The front and hind feet should be removed before any other incision is made in to the carcass.
- In removing the front feet, care should be taken to expose the tissues of the fore shank as little as possible and leave a "tie" of the hide completely covering the shank as far

down as possible toward the carpal articulation where the cut is made to remove the foot.

- Feet should be removed without contacting the hide or skin, and be placed in a container before taking them to the inedible room.
- The inspector veterinarian should make sure that the feet and legs affected with conditions found during the ante-mortem inspection are kept in isolation are presented for post mortem inspection with the corresponding carcass.

6.7 Pizzle removal

Penis and prepuce should be carefully removed without contaminating the carcass.

6.8 Bung (rectum) dropping

- ❖ A circular cut should be made around the anus and vulva taking care to leave the anal sphincter intact.
- ❖ Anus and rectum should be freed from the surrounding tissue with a clean knife.
- ❖ Bung (rectum) should be pulled out using a hook or other device, and tie it firmly, along with the neck of the urinary bladder, and then drop into the pelvic cavity so that fecal matter or urine may not escape and contaminating the carcass.
- ❖ Any small pieces of skin left on the anal region should be removed before returning to the pelvic cavity.
- ❖ A useful knit for the purpose consists of a loop placed behind the bung, through which one of the ends is passed. The two free ends are then pulled tight using the loop and tied.

6.9 Hide and skin removal

The inspector should ensure that application of the following guidelines:

- ❖ No opening should be made into the chest or abdomen before the hide is removed
- ❖ Skinning should begin at the hind shanks and proceed downward, in such a way that its outer surface rolls away from the carcass.
- ❖ Except for the original incisions for sticking and starting the skinning operations at the poll and shanks, incision into the skin should be made with the knife blade directed toward the hair side of the skin to prevent contaminating the flesh with cut hair.

- Carcasses should be kept sufficiently far apart from each other to prevent contamination from skinned parts of adjacent carcasses.
- To avoid shank contamination, the lower skinning should not begin until the carcass has passed the points of common contact, such as hindquarter skinning platforms and, the fore shanks is left on until the brisket and fore shanks are partially skinned.
- The tail should be skinned out for not causing contamination to the carcass.
- The same person should not perform more than one task at the same time.
- When establishment employees move the carcass from the skinning bed, the exposed parts of the carcass should be protected from contact with the floor or other fixed objects.
- When using mechanical hide or skin pullers, tremendous energy exerted during the final removal of the hide is not generating aerosols and air flow; any aerosols created at this stage should be directed away from the carcasses being skinned to prevent contamination of the carcasses.
- If hides or skins are removed from the department by means other than a chute, it should be designed and maintained to prevent sanitary problems.
- Spreading of hides or skins should not be practiced in the slaughter room.
- The equipment and facilities used for skinning and removal should be ensured for their compliance with the guidelines indicated in the “Export Abattoirs Construction Guidelines”.

6.10 Evisceration

The inspector veterinarian should ensure evisceration is conducted following the guidelines indicated below and in compliance with the equipment and facilities requirements set in the “Export Abattoirs Construction Guidelines”.

- The carcass of an animal should be eviscerated immediately after slaughter.
- Any contaminated part on the carcass should be trimmed off from the midline before opening the abdominal cavity.
- A small starting cut should be made on the caudal ventral side of the abdominal muscle and extend the incision downward to the chest area as much as sufficient space is available.

- The incision into the pelvic cavity to "ring" the bung should be made by a person with clean hands and a clean knife.
- Care should be taken to avoid cutting or breaking the paunch and intestines, and prior to evisceration, the rectum and neck of the bladder are secured to prevent urine and fecal leakage.
- At the time of evisceration, ties are made at the point where the small intestine leaves the stomach and at the point where the esophagus attaches to the paunch; at each of these two named points, two ties are made about 10 centimeters apart with the contents being stripped from the intervening portion of the intestine or esophagus, respectively, before the second tie is made so that the tissues can be severed between the ties without any spillage of contents.
- The removed viscera should be placed on the viscera inspection table.
- The thoracic viscera should be removed after the removal of the abdominal viscera is completed and placed in the viscera table.
- The uro-genital organs such as bladder, ovaries and uterus, should be removed in total without incising them, and transfer to inedible room.
- No part or parts of the innards (offal) should be left in the carcass.
- The eviscerator should not cut into any organ, nor he removes the gall bladder from the liver; and the gall bladder is not emptied on to the floor.
- After evisceration, the viscera should be identified by a similar number (tag), which was attached to the head and carcass
- While accidental contamination may occur, contaminated carcasses should be trimmed but not washed.
- The eviscerator should not flush out carcass cavities
- The eviscerator should wear a clean apron and boots constructed of acceptable material such as rubber or plastic. These boots should be white or otherwise distinctively and exclusively identified and worn only on the table and adjacent boot

cleaning compartment. The eviscerator also needs to have additional footwear to be worn while traveling to and from the work area.

- Hands should be washed regularly during the evisceration process.
- If the eviscerating knife is contaminated while evisceration is being done, it should be sanitized before reuse
- Contaminated footwear, apron, or knives should be thoroughly cleaned and disinfected.
- The saw or other instrument used to split the brisket should be disinfected after each use.

6.11 Work-up on the viscera table before inspection

The inspector should make sure that:

- No offal or viscera be removed from the viscera table until inspection is completed.
- Work-up operations on the viscera table are to be kept to a minimum until after inspection and maintain identification of the viscera with the carcass.
- Hepatic lymph nodes are to remain attached to the liver for inspection purposes.
- Kidneys should either be presented for inspection with other edible offal, or left hanging on the carcass by their attachments.

6.12 Carcass splitting

The inspector should ensure that:

- Prior to splitting, all contamination, abscesses, bruises, and tissue damaged by grubs should be removed from the midline area of the back in order to prevent spreading of such contaminants to bone and other surfaces by the saw or cleaver.
- When splitting is done at the half-hoist position, care should be taken to avoid the neck contacting the floor.
- Disinfection of the carcass splitting equipment should be done after each use.

6.13 Carcass trimming

- Trimming should be carried out before and after inspection

- The trimmer should remove hair, blood clots, pieces of hide, flecks of rail and other dust, and minor amounts of faecal material or stain
- Bruising or pathological lesions should not be trimmed before inspection.

6.14 Postmortem inspection

The head, viscera and carcass of each slaughter animal should be inspected by authorized inspector and inspector veterinarians based on the guidelines indicated in the Post-Mortem Inspection Guidelines and Export Abattoirs Construction Guidelines. The activities include, but not restricted to, the following:

- During presentation for inspection, the identity of the head, viscera and carcass should be maintained.
- In slaughter abattoirs where tails are removed from the carcass, the identity of tails should be maintained until final disposition of the carcass.
- No unnecessary and injudicious cuts, excisions and marks are made on carcasses during the meat inspection and care should be taken to avoid any unnecessary soiling, contamination or mutilation.

Based on the decisions of the inspector veterinarian, the abattoir employee should transfer the inspected products in to appropriate locations as indicated below:

- Those parts of carcasses or viscera which are free from diseases or gross contamination and considered safe for human consumption should be transferred to:
    - The whole or part of the carcass to the next stage of carcass dressing (carcass wash) room.
    - Those parts of viscera (stomach and intestines) to the casing cleaning room
    - The edible offals (such as heart, liver, head together with tongue, etc.) to offal preparation room
    - Inedible offals (such as lungs etc.) should be put in large cans (containers) marked "inedible" and transferred to condemned and inedible room.
- Those parts of carcass or viscera which may need further check-up by the inspecting veterinarian should be transferred to the product detaining room.

- Those parts of carcass or viscera, which are not fit for human consumption, should be put in large cans marked "condemned" and be transferred to the condemned and inedible room.
- Those parts of carcass or viscera, which are not fit for human consumption but are fit for pet animal consumption should be put in large cans marked "inedible" troughs and be transferred to the condemned and inedible room.
- No condemned head, carcass, or viscera should be left awaiting disposal during work breaks (it should be removed from the killing floor and transferred to the condemned and inedible room as soon as possible).
- There should be no direction reversal of condemned meat products to the edible products section (to all areas of the abattoir in which meat for human consumption is handled).
- No person removes or cause to be removed from an abattoir a carcass, meat, viscera or animal product which has been detained or condemned without the authorization of the inspector veterinarian in charge.

6.15 Carcass re-trimming

Carcass re-trimming should be done after inspection if there is still a need of removing any remnants of stick wounds, any residual pieces of hide, blood clots, bruised tissue and contamination before washing.

6.16 Carcass washing

- After postmortem inspection and re- trimming, all carcasses should be washed to remove blood and bone dust.
- Microbial intervention methods (acid washes, water washes, steam pasteurization, steam vacuuming, and use of other approved antimicrobial agents such as lactic acid) are effective in removing bacterial contamination that may not be visible on the carcass.

6.17 Carcass dripping

After washing, carcasses should be allowed to stay in the slaughter floor for about 30 minutes until the water is dripped out of the carcass so that stamping can easily be done.

6.18 Marking and branding

The application of information to carcasses and parts or their containers by a brand or mark is a fast, distinctive, and durable method of identification.

- All stamps or roller marks used to mark any carcass or meat should be constructed of a non-toxic, noncorrosive material and should be so constructed as to be readily cleanable.
- The stamps should contain the abattoir registration number; and the wording "Inspected and Passed" should be written in Amharic and English languages.
- The use of the Meat Inspection Legend is only permitted in connection with edible meat products slaughtered in a registered and licensed abattoir.
- The Meat Inspection Legend should be applied to the carcass before cooling.
- The Meat Inspection Legend shall not be used on inedible meat products or on containers of inedible meat products.
- A purple colored ink is required where stamps are applied to carcasses or meat and should be manufactured from harmless, edible ingredients approved for use by the relevant legislation of the country.
- All carcasses after being approved at inspection and as soon as the carcass is dry enough to hold the ink, should be legibly branded with the official inspection legend (Inspected and passed).
- Brands are to be applied by company staff under the direct supervision of the inspector and inspector veterinarian.
- All carcasses are to be branded legibly with inspection legend after inspection with four stamps per side (in neck, thoracic, abdominal and hind quarter areas) and one stamp on each of the left and right peritoneum (a total of 10 stamps per carcass).

- Carcasses intended for de-boning can directly be transferred to the de-boning room without branding or marking (which will be branded after being packed and labeled).
- The stamp of approval should be kept and used under control of a veterinary inspector;
- when not in use the stamp should be kept in safe custody to the approval of the veterinary inspector; and
- a stamp of approval should never be used at an abattoir where the abattoir number differs from the number on the stamp.
- Stamps and roller marking equipment should be cleaned and sterilized regularly during use.
- All marking equipment should be kept hygienically, away from the floor and other dirty surfaces.
- No person may place a stamp of approval on, or remove such mark from any carcass, part thereof, meat or a wrapping, packing or container, except under the supervision of the veterinary inspector.
- The veterinary inspector may at any time re-inspect a carcass or meat in an abattoir, notwithstanding that it may already have been passed for consumption and, if upon re-inspection he or she is of the opinion that it is no longer fit for human or animal consumption, he or she should remove the stamp of approval by trimming, and such meat should be condemned.

6.19 Shrouding

Carcasses (mostly beef), which are not to be cut, or de-boned should be shrouded or wrapped with sterile linen sheets or a large piece of cloth soaked in 10% salt solution (sodium chloride solution which helps to minimize color shrink and improve the external appearance of the carcass) around the outside of the carcass halves and attached with metal shroud pins and then conveyed to the cold room.

6.20 De-boning and cutting room operations

- During cutting, boning, wrapping and packaging, the meat should be maintained at not more than 7ºC by means of an ambient temperature (the cutting room temperature) of not more than 10ºC.
- Meat intended for cutting should be brought into the workrooms progressively as needed;
- Cutting up, de-boning and packing should be carried out without delay (within one hour), there after the meat should be transported to chilling room.
- The work area and equipment used for carcass processing such as knives, saws, slicers, scabbards and other storage devices for these implements should be cleaned and sanitized before beginning operations. Work areas and equipment used should also be cleaned and disinfected during each break or after each instance of contamination.
- Measures that would prevent cross contamination from traffic, people and airflow should be put in place
- Temperatures maintained during the de-boning and cutting operations should be monitored and recorded.

6.21 Weighing

Before products are to be dispatched, they should be weighed in a weighing scale and the abattoir employee should attach the weight card before the carcass is transferred for packaging and labeling.

6.22 Packaging and labeling room operations

6.22.1 Packaging

- Packaging materials include, wrapping materials, films, synthetic casings, nettings, trays pouches, bags and any other material which may come into contact with a meat product. This also includes gases used in modified atmosphere packaging.

- Packaging materials should not impart any undesirable substance to the meat product, either chemically, physically or microbiologically and should protect them sufficiently to avoid contamination.
- Liners should be used when packaging exposed meat products into unwaxed cardboard containers. Every effort should be made to prevent the meat products from coming into contact with the exposed surfaces of any shipping containers during filling
- Packaging material should be stored and used in a clean and sanitary manner.
- The wrapping should be sufficient for the purpose of protecting the meat from contamination.
- Products (such as de-boned meat, meat cuts, offals and others) for which inspection marks were not required to apply directly to the product surface, inspection marks should be applied on the containers or the packaging material.

6.22.2 Vacuum packing

- Today the most widely used method employed to extend the storage life of fresh meat is vacuum packaging. Vacuum packaging is intended to preserve products from microbial contamination, from dehydration and from environmental factors that affect quality and nutrition. Vacuum packaged meat of normal pH (<5.8) can be stored for 12 to 14 weeks at 0^{o}C.
- Meat should be packed in gas-permeable plastic laminated bags at 2-4°C and a pH of 5.5-5.8 and stored at between -18°C and 1°C. At this time, residual oxygen is used up and carbon dioxide accumulates. Without air and water, bacterial growth is significantly reduced. The meat regains its red color on re-exposure to air. Under a good vacuum, the package headspace consists of <1% oxygen and 10–20% carbon oxide.
- The materials used, besides being specifically for food, should be chemically inert and prevent the transfer of foreign odors or flavors. They should be stable at low and high temperatures, elastic, tear-resistant, and proof against water vapor, oxygen and volatile substances. They should offer protection against light, particularly UV light.

- The following plastics should be used which are compatible with the meat industry for cold storage. Polyamide (PA), polyethylene (PE), polyester (polyterephthalic acid ester) (PET/PETP), polyvinylchloride (PVC), polyvinyliden chloride (PVDC).

6.22.3 Labeling

- Stamped label should be placed on the package in such a way that opening of the package is impossible without breaking of its wholeness.
- Label information should be conspicuously displayed in a manner that ordinary consumer can easily read and understand.
- The product labels should state the following:
    - Country of origin,
    - Establishment of origin,
    - Product identification (such as species and other details of the animal, from which the meat is derived from),
    - Net weight,
    - Manufacturing date
    - Expiry date etc
- Once the product is properly packed and labeled, it should be immediately transferred to the chilling or cold room and stay there until dispatching.

6.23 Cold room operations

Meat that is fit for human consumption should be handled and stored in a manner that will protect from contamination and deterioration. In order to preserve the quality, bloom, and weight of meat, it is highly desirable to begin refrigeration as soon as possible after slaughter.

The inspectors should ensure the requirements stated in the “Export Abattoirs Construction Guidelines” and “Meat Cold Chain Guideline” are practiced and strictly adhered to. The major guidelines indicated below, but not restricted to, should be applied in cold room operations.

6.23.1 Initial cooling

- As soon as the dressing operations are completed (within one hour), carcasses, sides or quarters, should be moved to a room with a temperature of 10^0c (3^0c for offals) and the mean air speed at a level above 0.75m/s to be kept for the first 12 hours to allow carcass maturation.
- The maximum storage capacity of a cooler should not be exceeded and there should be adequate air flow. Monitoring internal temperatures of carcasses will confirm if a cooler is overcrowded.

6.23.2 Chilling

- After 12 hours initial cooling, the product's surface temperature should continue to go down in a continuous manner to 4°C or less. This should take place as quickly as possible and the cooling media (chilling room) shall be maintained within 0 to 2^oc and the mean air speed over the product above 0.75 m/s with relative humidity below 95% or if the product is to be stored for more than 72 hours, below 90%.
- For the storage of offal, the temperature should be maintained below -2 ^{o}c or, if to be stored for more than 72 hours and below -10 ^{o}c.
- Offals such as stomach, intestine, lungs, spleen, head and feet should be held in a separate chamber and spread out to allow for more effective cold action but offals such as liver, kidney and heart can be given the same cooling treatment as the carcass.
- Measures should be put in place to control the holding temperature of the carcass or offal chilling rooms. Refrigeration parameters should be defined, established and recorded.
- Carcass temperature should be taken and recorded daily from 5 randomly spaced locations.
- Chilling room condensation should be prevented or minimized.

6.23.3 Freezing

- The carcasses can be frozen whole or cut transversely along the last rib into two and packed in a way to allow free air movement around them.

- As soon as the dressing operations are completed, carcasses, sides or quarters, should be moved to a room with a temperature of 10 ^{0}c and the mean air speed at a level above 0.75m/s to be kept for the first 12 hours.
- The freezing speed which is the velocity with which a temperature front moves through the body of the product (cm/h) should be from 2 to 5 cm/h. Slow freezing is considered to be below 1 cm/h and quick freezing above 5 cm/h.
- Freezing is performed in tunnels or in chambers with intense air circulation called blast chambers while air should circulate at high speed, from 2 to 4 m/sec up to 6 m/sec. Air temperatures should be in the range of -30° C to -35°C. The relative humidity should be maintained at 95 percent or above. The higher the relative humidity the better: a range of 95–98 percent prevents meat dehydration. Under the above conditions, half beef carcasses or quarters are frozen in about 16– 20 hours, cut-up meat in cardboard boxes measuring 54×34×16 cm in about 4 hours and small prepackaged cuts in about 1 hour.
- A product can be considered frozen when its center has a temperature of -12°C or less.
- Meats properly frozen. should be transferred from the freezer to storage chambers of -18°C to -25°C where temperature, relative humidity and air circulation should be adequate and can be tightly controlled.
- For the storage of offal, the temperature should be maintained below -2^{o}c but should be maintained below -10^{o}c if to be stored for more than 72 hours.

In all chilling and/or freezing rooms the following activities should be performed:

- Each room should be loaded as quickly as possible.
- Meat should be hanging or placed in a suitable corrosion resistant trays by allowing adequate circulation of air around meat (keep 0.3 to 0.4m on the rail minimum space requirement between carcasses).
- Meat that is not in cartons should be placed in corrosion resistant trays and allowed to get sufficient circulation of air.
- Drips from one piece to the other should be avoided.

- Carcasses should not touch each other
- Carcasses of different species should not occupy the same area
- Doors should not be left open for extended periods, and should be closed immediately after use.
- Entry to the room should be restricted only to personnel required to carry out the operations
- Chilling room or freezing rooms or freezer store should not be loaded beyond their designed capacity.
- Temperature should be checked and recorded regularly
- Refrigerating coils should be defrosted and the defrosted water removed frequently to prevent excessive accumulation of ice and loss of refrigerating efficiency.
- The abattoir management should assign an individual to accomplish the task of regular temperature reading and recording or automatic temperature recorders should be installed.

6.24 Dispatching and meat transport

The meat inspectors should ensure that the meat and meat products are delivered in unaltered manner in any way that will affect their fitness for human consumption until they are delivered to the customer or retailer**.** They have to ensure that the meat and meat products are dispatched directly from the abattoir's dispatch area and transported in the following manner:

- Meat should not be placed in any form of transport that has not been cleaned and sanitized before loading.
- Meat should not come in to contact with the floor.
- Where human labor is required for transportation, personnel should be healthy and neatly dressed with proper protective clothing
- Carcasses, sides and quarters, other than those that are adequately wrapped and frozen, should be hung during transport or placed in a suitable manner on racks or similar equipment.
- Meat should be transported under the required temperature.

6.25 Edible offal room operations

6.25.1 Red offal

Red offal should be washed with clean running water, hung on hooks or placed in containers and chilled in a red offal or carcass chiller, but it need not be chilled at the abattoir if dispatched on a continuous basis.

- Red offal may not be stored, or come into contact, with rough offal.
- Further separation, cutting and packing of red offal should be done in a separate area or room.
- Where red offal is packed in cartons, containers or plastic bags for dispatch, chilling or freezing – it may only be done in a separate area or room and equipment should be provided for this function;
- Boxed offal may not be stored in the same chiller as carcasses or un-boxed offal.

Head:

- Head meat can be harvested for human consumption only after the post mortem inspection is completed and the carcass has been passed.
- The intact head must be skinned and visibly clean. The nasal and oral cavities must be flushed before the head is presented for inspection.
- Cheek meat must be trimmed free of the salivary glands and mucous membranes, washed thoroughly and then chilled to 3°C or lower, as soon as possible.
- If firearms are used for stunning, the cheek meat cannot be harvested because of the lead fragments that may enter in to the cheek muscles.

Tongue: Tongues must be trimmed to remove any portions of the larynx, epiglottis, or tonsils. The severed base of the tongue must be trimmed if there is any contamination. Tongues must be washed and then chilled to 3°C or lower, as soon as possible.

Heart: Hearts shall be cut open or inverted to permit the complete removal of all blood clots. The aorta and other major blood vessels are to be removed to within 2 cm of their origin from the external surface of the heart to the end of the cut vessels. After washing, hearts must be drained and then chilled to 3°C or lower, as soon as possible.

Liver: The gall bladder shall be removed from the liver but can be harvested separately as edible if there is a need to do so. The inspector shall open the hepatic ducts

longitudinally and examine them for the presence of liver flukes. Livers with defects such as parasites (e.g. flukes), lump, tumour, abscess shall not be harvested for human consumption.

Kidney: Kidneys from food animals may be harvested as an edible product.

Oesophagus meat: The oesophagus can be harvested by cutting through its musculature distally adjacent to the rumen/stomach without cutting into the mucosal lumen. The oesophagus is then pulled away from the rumen/stomach.

6.25.2 Washing of rough offal

- Rough offal should be removed from the dressing room to the offal room directly adjacent and connected thereto, after being passed, where paunches and intestines should be:
    - separated and emptied of its contents;
    - washed with clean running water; and
    - hung on hooks for cooling and drip drying before and during chilling.
- Equipment should be provided for the emptying of rumens and intestines and the ruminal and intestinal content should be removed continuously.
- Where washed paunches or intestines are packed in containers or plastic bags for dispatch, chilling or freezing, a storage facility for clean bags or containers, for a day's use, should be provided.
- Edible washed rough offal should be stored in a chiller at an air temperature not exceeding minus 2^{o}C, but it need not be chilled at the abattoir if dispatched on a continuous basis.

6.26 Condemned and inedible room operations

Although condemned and inedible products may be used for other useful purposes other than human consumption, they should be handled carefully and disposed off in a sanitary manner following the guidelines indicated below:

6.26.1 Condemned products handling

- Condemned meat products include the following: -

- Carcasses and portions of carcasses which upon inspection or re-inspection are found to be affected by disease or an abnormal condition that renders them unfit for human consumption.
- Animals condemned on ante-mortem inspection, carcasses of animals that died while being driven to the export abattoir and carcasses of animals that died in the yard or a livestock holding pen of the export abattoir.

❖ The condemned materials, which were transferred from the slaughter hall, should stay in the condemned room until they are treated by the veterinarian to make them obviously unfit for human meat (by sight, smell, or taste by adding certain chemicals such as powdered charcoal, kerosen, food grade dyes, etc.)

❖ Before they leave the abattoir for further processing or to be destroyed in incinerator prepared for this purpose, they should be packed in a leak proof and marked containers with the word ***'condemned".***

❖ Dead and condemned animals to be destroyed during ant-mortem inspection should not be taken away from the condemned and inedible room until rendered inedible by the veterinarian.

❖ No condemned head, carcass, or viscera is to be left awaiting disposal during work breaks (it should be removed from the killing floor and transferred to the condemned and inedible room as soon as possible).

❖ There should be no direction reversal of condemned meat products to the edible products section (to all areas of the abattoir in which meat for human consumption is handled).

❖ As in the other areas of the abattoir, sanitary conditions should be maintained at all times in the condemned and inedible room of the abattoir by applying a daily cleanup activity and taking immediate effective actions if unsanitary conditions develop).

❖ An employee working in the condemned and inedible room of the abattoir should completely change his protective clothing and thoroughly wash his hands before he commences work in the edible section of the abattoir

❖ There should be proper segregation of condemned and inedible products, but if mixing of condemned meat products and other inedible meat products occur, all inedible meat products should be treated as condemned meat products.

- When a carcass is condemned an inspector veterinarian should put a "Condemned" mark on its outer surface to make identification obvious.
- Under no circumstance should the skinning, evisceration and other preparation of animals condemned on ante mortem inspection, or found dead carcasses, be allowed on the slaughter floor. Such condemned meat animals or found dead carcasses should be directly conveyed from the livestock yards or pens to the condemned and inedible room of the export abattoir.
- Containers used for condemned meat products should be distinctly marked "Condemned". They should be preferably of a color that distinguishes them from containers used for edible meat products.
- Immediately after disposal, any receptacle (container) coming in to contact with the condemned products should be cleaned & disinfected properly.

6.26.2 Condemned meat products that require sterilization

Condemned meat products should remain under strict control from the time of condemnation until they are disposed of in an acceptable manner. The abattoir management should be aware that meat and meat products considered unfit for human consumption should be seized and processed or treated (by heating or freezing), recycled or destroyed, as decided and supervised by the inspector veterinarian.

The guidelines to follow should include, but not limited to, one or several of the following:

- Product should be freely slashed, crushed or ground and mixed or sprayed with an accepted denaturant such as powdered charcoal, food grade dyes, etc.
- The denaturant should be reasonably well distributed to ensure that all condemned meat products are denatured.
- The product should then be transferred in containers marked with the word "Condemned" to an authorized inedible rendering abattoir or incinerator for sterilization.
- In the case of a carcass that has not been dressed (dead animals or those condemned during ante- mortem inspection), the denaturant should be applied by injecting it into

portions of the carcass to the extent necessary to preclude its use for human or pet animal consumption purposes.

- If the condemned carcass is known to be affected with some potentially hazardous disease conditions such as "Anthrax", the abattoir should facilitate its destruction to be carried out based on the guidelines indicated below under emergency situation.

6.26.3 Condemned product approved for pet animal food

- Operators can harvest or salvage certain condemned meat products, which may be unfit for human consumption but be safe for pet animals, with the consent of the inspector veterinarian.
- Denaturing is required to clearly distinguish such pet animal meat products from those prepared and approved for human consumption.
- In order to be considered as being properly denatured, charcoal or another denaturing agent (accepted by the Export Abattoirs Inspection and Certification Directorate) would have to be added to the meat product.

6.27 Non-condemned inedible meat products handling

Inedible meat products include those meat products which are not condemned but are not edible due to their nature (such as lungs, spleen, uterus, ovaries, udder and others). The guidelines to follow includes, but not limited to, the following.

- There should be no direction reversal of inedible meat products to the edible products section (to all areas of the abattoir in which meat for human consumption is handled) once they are placed in the condemned and inedible room.
- Inedible meat products should stay in the condemned and inedible room until they are treated by the inspector veterinarian to make them obviously unfit for human consumption (by sight, smell, or taste) and be liberally stamped with “Condemned" before they leave the abattoir.
- The dispatch containers for meat products destined for pet animal meat should be labeled ***"pet meat".***
- Those products that can be used for pet animal meat, should be cooled, packed and dispatched in separation with the edible products.

- The inedible products, which are not used for pet meat, once treated by the veterinarian to make them obviously unfit for human or pet animal meat (by sight, smell, or taste by adding certain chemicals such as charcoal, kerosene etc.) and be liberally stamped with "***Condemned***" should be packed in a properly "**inedible**" marked and leak proof containers and send to the designated rendering plant for further processing or to the incinerator to be destroyed.
- In similar manner**,** other by-products such as, horns, hoofs and bones should be kept away from the meat stores and disposed off according to the provisions of the relevant regulations (at least 2kms away from the abattoir's campus if not to be used for further processing or be incinerated.
- Immediately after disposal any receptacle (container) coming in to contact with the inedible products should be cleaned & disinfected.

7. References

1. CAC, 1993. Recommended International Code for Ante-Mortem and Post-Mortem Inspection of Slaughter Animals and for Ante-Mortem and Post-Mortem Judgement of Slaughter Animals and Meat, Codex Alimentarius Commission, CAC/RCP 41, 1993.
2. CAC, 2005: Code of Hygienic Practice for Meat, Codex Alimentarius Commission, CAC/RCP 58-2005.
3. CFIA, 2017. Ante and Post-mortem Procedures, Dispositions, Monitoring and Controls, Meat Hygiene Manual of Procedures, Canadian Meat Inspection Agency, Canada.
4. CFIA, 2018. Meat Processing Controls and Procedures, Meat Hygiene Manual of Procedures, Canadian Meat Inspection Agency, Canada.
5. CFIA, 2019. Dressing Procedures and Preparation of Edible Parts, Food-specific Requirements and Guidance, Canadian Meat Inspection Agency, Canada
6. CFIA, 2019. Guidelines for Stunning Techniques of Mammalian Food Animals, Food-Specific Requirements and Guidance, Canadian Food Inspection Agency, Canada
7. DoAWR, 2019. Guideline, Approved Arrangement-Meat, Department of Agriculture and Water Resources, Australia
8. ESA, 2017. Drinking Water Standard, Drinking Water Specification, Compulsory Ethiopian Standard, 2nd edition, 2017, CES 58.
9. FAO, 1985: Slaughterhouse Cleaning and Sanitation, Food and Agriculture Organization of the United Nations, FAO Animal Production and Health Paper 119 53, Rome, Italy.
10. FAO, 1991. Manual on Meat Cold Store Operation and Management, Food and Agriculture Organization of the United Nations, FAO Animal Production and Health Paper 92.
11. FAO, 1994: Manual on Meat Inspection for Developing Countries, Food and Agriculture Organization of the United Nations, FAO Animal Production and Health Paper 119, Rome, Italy

12. FAO, 2004. Good Practices for the Meat Industry, Food and Agriculture Organization of the United Nations, Rome, Italy.
13. FSA, 2017. Personal Hygiene, Meat Industry Guide, Food Safety Authority, UK
14. MoARD, 2007. Meat Inspectors and Inspector Veterinarians Guide to Regulate Export Abattoir Operations, Ministry of Agriculture and Rural Development, Animal and Plant Health Regulatory Directorate, Addis Ababa, Ethiopia.
15. MOARD, 2009: Ante-Mortem Inspection Guideline, Ministry of Agriculture and Rural Development, Animal and Plant Health Regulatory Directorate, Addis Ababa, Ethiopia.
16. NDoA, 2000. Meat Inspectors Manual, Red Meat, National Department of Agriculture, Republic of South Africa.
17. NZFSA, 2004. Hygiene and Sanitation, Industry Standard 3/ Industry Agreed Standard 3 (IS3/IAS3), New Zealand Food Safety Authority, New Zealand
18. NZFSA, 2006. Animal Products (Ante-mortem and Post-mortem Examination of Mammals, Ostriches and Emu Intended for Human Consumption) Notice 2006, Ministry of Agriculture and Forestry, New Zealand Food Safety Authority, New zealand.
19. OIE (2018): Trade measures, import/export procedures and veterinary certification, section 5. Terrestrial Animal Health Code.
20. UN Environment and the IIR, 2018. Cold Chain Technology Brief, Refrigeration in Food Production and Processing.

Annexes

Annex I. Water used in the export abattoir

Water used in an export abattoir for cleaning, hand washing, and carcasses spraying etc. must be of potable quality.

Chlorination of water

Where automatic chlorinators are used in an export abattoir, the management should establish controls procedures to ensure water potability as follows:

- A metering device for adding chlorine in the correct concentration, relative to the water flow rate, designed to readily indicate malfunction.
- At least twice daily, tests should be made to determine the total available chlorine level at a specific point, remotely located from the chlorine application site, but before distribution to the abattoir system.

Analyses for potablity of water

Analyses of water for potability must be performed at federal public health laboratories.

1. **Physical requirements**

Physical characteristics of drinking water shall conform to the levels specified below:

Table 1. Physical characteristics of drinking water

Characteristics	**Maximum permissible level**
Odour	Unobjectionable
Taste	Unobjectionable
Turbidity	5
Colour, TCU	15

2. Chemical requirements

2.1. Content of toxic and/or disease-causing substances

When tested, the characteristics that affect the safety (water that is intended for drinking and domestic purposes whose limits for toxic substances, bacteriological and organoleptic levels conform to the requirements of this standard) of drinking water shall conform to the levels specified below in table 2.

If nitrates (expressed as N) are present in concentration in excess of 10mg/l, the water may be unsuitable for use by infants under one year age, and an alternative source of supply should be found for such infants use or the water from the same source should be corrected in case of lack of other sources.

Table 2. Content of toxic and /or diseases causing substances of drinking water

Substance or characteristics	Maximum permissible level
Barium (as Ba) mg/l, Max	0.7
Total Mercury (as Hg) mg/l, Max	0.001
Cadmium (as Cd) mg/l, Max	0.003
Total Arsenic (as As) mg/l, Max	0.01
Total cyanide (as CN) mg/l, Max	0.07
Total Nitrite (as NO_2) mg/l, Max	3
Total Nitrate (as NO3) mg/l, Max	50
Phenolic compounds (as phenols) mg/l, Max	0.002
Lead (as Pb) mg/l, Max	0.01
Boron (as B) mg/l, Max	0.3
Selenium (as Se) mg/l, Max	0.01
Fluoride (as F) mg/l, Max	1.5
Chromium (as Cr) mg/l, Max	0.05
Pesticide and organic constituents, µg/l, Max	
a. DDT	2
b. Heptachlor and heptachlor epoxide	0.03
c. Hexachlorobenzene	1
d. Lindane (Gamma – BHC)	2
e. Methoxychlor	20
f. Aldrin/Dieldrine	0.03
g. 1,2 Dichloro ethane	3
h. 1,1,1 Trichloro ethane	200
i. -Trichloro ethene	70
j. Trichlorobenzenes (total)	20
k. Hexachlorobutadiene	0.6

3. Requirement for other constituents

Radioactivity, if present shall not exceed the following levels, when determined according to ES ISO 9696 and ES ISO 9697 respectively.

a. Gross alpha activity 0.1 Bq/l, Max
b. Gross beta activity 1 Bq/l, Max

4. Microbiological requirements

When tested with the corresponding test methods, the bacteriological requirements of treated drinking water shall not exceed the levels shown in table 3 below.

Table.3. Microbiological requirement

No	Organism	Maximum limit	Remark
1.	Coliform organisms, number per 100ml	undetectable	
2.	E. coli, number per 100ml	undetectable	
3.	Total viable organisms, colonies per ml	100	
4.	Faecal streptococci, number per 100ml	undetectable	
5.	Staphylococcus aureus, number per 100ml	undetectable	
6.	Pseudomonas aeruginosa, number per 100ml	undetectable	
7.	Shigella, number per 100ml	absent	
8.	Salmonella, number per 100ml	absent	
9.	Yeast and mould	undetectable	
10	Clostridium perfrengens (sulphate reducing anaerobes)	absent	Shall be tested initially then monthly
11	Cryptosporidium spp. and Giardia spp.	undetectable	Shall be tested during rainy season or when there is an outbreak of water borne diseases
12	Coliphages	undetectable	Shall be tested annually
13	Vibro cholerae	absent	

5. Sampling

5.1 Sampling for bacteriological examination

Sampling should be regular (see table 4), and its frequency will mainly depend on the following factors:

a. Quality of the water harnessed
b. Type of treatment for drinking worthiness
c. Risk of contamination
d. Background of public water supply network, and
e. number of people served

Table 4. minimum sampling frequencies for drinking water in the distribution system

Population served	**Samples to be taken monthly**	**Remark**
Less than 5000	1 sample	Collection, transportation and storage shall be in accordance with ES ISO 5667-5.
5000 – 100,000	1 sample per 5000 population	
More than 100,000	1 sample per 10000 population plus 10 additional samples	

5.2 Sampling for physical and chemical examination

Sampling frequency for the examination of physical and chemical characteristics shall be carried out at least twice per year, one is in the rainy season and the other is in dry season. The frequency of this examination shall be increased when toxic substances are known to be present at sub-tolerance levels in the source of supply, or in certain special circumstances as, for example, when new industries that may be discharging toxic wastes are established in the area and the danger of epidemic arising. Collection, transportation and storage of samples shall be in accordance with ES ISO 5667-5

Frequency and type of analysis

(a) Bacteriological analysis

- Export abattoirs using only municipal water; require bacteriological analyses on a semi-annual basis with satisfactory results.
- Export abattoirs supplementing municipal supplies with water from private wells or using solely water from private wells, require bacteriological analyses on a monthly basis with satisfactory results.
- Whenever a sample is submitted for bacteriological analyses, enumeration of coliforms per 100 ml and total plate count should be requested.

(b) Chemical analysis

Water obtained from municipal supplies need not be sampled at export abattoirs since

chemical analysis is carried out at the source. However, water from private wells should be subject to at least one initial chemical analysis with a satisfactory result.

Water sample collection for analysis

- Export abattoir management is responsible for the collection and shipment of samples to the federal public health laboratory in a satisfactory manner.
- The site of collection should be varied from sample to sample to provide a maximum coverage of water outlets within the export abattoir.
- The export abattoir management should request and obtain sterile containers for the collection of samples and instructions regarding shipment from laboratories performing the analyses.

Annex II. Cleaning and disinfection

Good hygiene demands effective and regular cleaning and disinfection of abattoir's equipment and vehicles to remove food residues and dirt, which may contain food poisoning and spoilage microorganisms.

Detergents

Detergents must have good wetting capacity and rinsing property. The detergent used should be non- corrosive and compatible with other materials including disinfectants used in the sanitation program. While cold solutions may be effective in some circumstances, the use of heat is required in removing fat deposits. The deposition of mineral salts on equipment may form a hard scale *('stone'*) especially in the presence of fats or proteins; the use of an acid or alkaline detergent sequentially may be necessary to remove such deposits.

Industrial detergents and disinfectants that may be required for cleaning and disinfection need careful handling.

- Alkaline and acid products must not be mixed.
- Hypochlorite solutions must not be mixed with acidic products, as chlorine gas will be released.
- Operators handling strong alkaline or acidic products must wear protective clothing and goggles and must be thoroughly instructed the handling techniques.

- Containers in which such substances are kept should be clearly marked and stored separately from meat inspection and packaging materials.

Cleaning and cleaning procedures:

- Removal of gross debris from surface by brushing and scrapping of deposits followed by application of water
- Application of detergent solution to loosen soil and bacterial films and holding them in solution or suspension
- Rinsing with hot water
- Disinfection (daily or weekly as may be required).

Cleaning methods:

Cleaning can be carried out by separate or combined use of physical and chemical methods. According to circumstances one or more of the following methods may be used:

Manual cleaning:

Involving removal of soil by scrubbing in the presence of detergent solution. For small item of equipment, soaking in a detergent solution in a separate receptacle may be necessary to loosen the soil prior to scrubbing.

In-Place cleaning:

The cleaning of equipment including pipe runs, with water and detergent solution, without dismantling the equipment or pipe runs. A minimum fluid velocity of 1.5 meters per second (5 feet per second) with turbulent flow is required for effective cleaning of pipe runs. If it cannot be cleaned satisfactorily by this method, the parts should be dismantled and cleaned.

Low- pressure high volume spray: the application of water or detergent solution in large volumes at pressure up to 6.8 bar (100 psi).

High-pressure low-volume spray: the application of water or detergent solution in low volume at high pressure up to 68 hpz (1000 lbf/ sq. in)

Foam cleaning: the application of detergent in the form of foam, which is allowed to remain for up to 15-20 minutes and then rinsed off with a water spray.

Drying after cleaning:

If equipment is left wet after cleaning, microorganisms may grow in the water film. It is important that the equipment is left dry as soon as possible after cleaning by air-drying or by use of non- reusable tissue or absorbent materials.

Adequate drainage points should be provided in equipment that can-not be dismantled and drying racks provided for small pieces. Any equipment that unavoidably remains wet for a period during which significant microbial growth might occur should be disinfected immediately before use.

Disinfection:

No disinfection procedure can exert its full effect unless its use is preceded by thorough cleaning. The abattoir management, in consultation with the regulatory team, should chose disinfectants according to:

- The microorganisms to be killed,
- The type of meat to be processed,
- And the material making up the meat contact surfaces,
- The character of the water available and,
- The method of cleaning used.

Disinfection by heat

The application of moist heat to raise the surface temperature to at least 70^{o}c is one of the commonest and most useful forms of disinfection.

Hot-water disinfection: This is the most commonly used through out the meat industry. Removable parts of machinery and smaller items of equipment are submerged in a tank of water at a temperature of 82^{o}c for two minutes.

Chemical disinfection

The continued use of a certain chemical disinfectant may lead to the selection of resistant microorganisms. Chemical disinfection should be used where use of heat would not be practicable. The following factors affect the performance of chemical disinfectants:

- ***Inactivation by dirt:*** the effectiveness of all chemical disinfectants is reduced by the presence of dirt.

- Temperature*:* a warm solution is preferable to a cold solution. There are, however, limitations to the temperature that may be used, and the manufacturers' guidance should be followed. For instance, Iodophors release iodine above 43^{o}c, which can result in staining of materials, and the corrosive action of chlorine is also increased when hot hypochlorite solutions are used.
- ***Time and concentration:*** the minimum contact time and concentration of chemicals should be used according to the manufacturers' instructions.
- ***Stability:*** all disinfectant solutions should be freshly made in clean utensils as prolonged keeping of ready- to- use solutions may be ineffective or may serve as a reservoir of resistant organisms. Disinfectants may be inactivated if mixed with detergents or other disinfectant solutions.

Chemicals suitable for disinfection in meat premises

Chemical disinfectants that taint or stain the meat such as phenolics should not be used in meat premises or vehicles. The following include, but not limited to, the chemicals commonly used in abattoirs:

Chlorine and chlorine-based products

If properly used, these are among the most suitable for meat abattoir and vehicle. They are relatively cheap and the most suitable general-purpose disinfectants. They should be used at concentrations of 100-250 mg of available chlorine per liter.

This group of disinfectants is corrosive to metals and has a bleaching action. Therefore, surfaces of disinfection should be subjected to a final rinsing as soon as possible after an adequate contact time. Chlorine disinfectants with the exception of chlorine dioxide are readily inactivated by the presence of organic soil.

Iodophors

These are particularly suitable particularly in those circumstances where an acid cleaner is required. They have a rapid action and a wide spectrum of ant microbial activity. A solution of about 25-50 mg per liter of available iodine at pH of less than 4 is usually required for disinfecting clean surfaces as they are readily inactivated by organic matter.

They may have a corrosive action on metals depending up on the particular formulation f the iodophor and the nature of the surface to be applied. For this reason, care should be taken to rinse them away after use.

Quaternary ammonium compounds

They have good detergent characteristics and are relatively non- corrosive to metal and non- toxic but unlike iodophors and chlorine, are not as effective against gram-negative bacteria.

The solutions tend to adhere surfaces and through rinsing is necessary. They should be used at concentrations of about 200-1200 mg per liter. They are not compatible with soap or anionic detergents.

Amphoteric surfactants

These are comparatively recent types of disinfectants having both detergent and antimicrobial properties. They are of low toxicity, relatively non- corrosive, and efficient disinfectants if used according to the manufacturers' recommendations.

Cleaning and disinfection can be regarded as effective when:

- no more visible dirt occurs;
- no residues from the cleaners or disinfectants occur on working surfaces;
- there are no mineral deposits from the water;
- no unacceptable smells or odors occur;
- there are no stains;
- no physical damage such as cracks or splintering is present;
- acceptable bacteriological counts are obtained.

Do's and Don'ts with sanitation programmes

Do:

- Remove gross soils such as scraps, fat, meat juices and other organic matter before applying the detergent foam or solution.
- Always rinse with warm water (40-50 °C).
- Foam or scrub with detergent solution (60-70º C).
- Allow a contact time of 10 minutes for foam.

- ❖ Use disinfectants at the recommended concentration only.
- ❖ Drain equipment and store dry where possible.

Do not do:

- ❖ Do not misuse chemicals - both overuse and under-use is wasteful.
- ❖ Do not use cold water - it increases your chemical requirements.
- ❖ Do not mix different chemicals without the manufacturer's instructions they may react dangerously or may neutralize each other.
- ❖ Do not add chemicals to foodstuffs.
- ❖ Do not use pieces of cloth (rags) anywhere - it facilitates contamination of surfaces and products.

Annex III. Sample sanitation standard operating procedure

Preoperational Sanitation (equipment and facility cleaning)

A. All equipment will be disassembled, cleaned, and sanitized before starting production.

1. Establishment sanitary procedure for cleaning and sanitizing equipment.
   - o All equipments have product debris and are removed.
   - o Equipment will be rinsed with water to remove remaining debris.
   - o An approved cleaner should be applied to equipment.
   - o Equipment will be sanitized with approved sanitizer and rinsed with potable water.
   - o The equipment is reassembled.
2. Implementing, monitoring and record keeping
   - ❖ Team Captains perform daily organoleptic sanitation inspection after preoperational equipment cleaning and sanitizing.
   - ❖ The results will be recorded on a Preoperational Sanitation Form.
   - ❖ If found to be acceptable, the appropriate line will be checked.
   - ❖ If corrective actions are needed, such actions will be documented.
3. Corrective actions
   - o The Team Captains determines that the equipment on hand does not pass organoleptic examination, the cleaning procedure and inspections are repeated.
   - o The Team Captains monitor the cleaning of the equipment on hand and retrains employees if necessary.

- Corrective actions are recorded on Pre-Operational Sanitation Forms.

B. Cleaning of facilities including floors, walls, and ceilings.

1. Cleaning procedures:
   - Debris is swept up and discarded.
   - Facilities are rinsed with potable water.
   - Facilities are cleaned with approved cleaner.
   - Facilities are rinsed with potable water.

2. Cleaning of floors and walls are done at the end of each production day. Ceilings are cleaned as needed.

3. Establishment monitoring
   - The team captain performs daily organoleptic inspection before operation begins.
   - Results are recorded on a Preoperational Sanitation Form.

4. Corrective action
   - When the team captain finds that the facilities do not pass organoleptic inspection, the cleaning procedures and inspections are repeated.
   - The team captain inspects the cleaning of the facilities and retrains employees as needed.
   - Corrective action to prevent direct product contamination or adulteration are recorded on Pre-operational Sanitation Forms.

I. Operational sanitation (equipment and facility cleaning)

A. Processing is performed under sanitary conditions to prevent direct and cross contamination of the product.

1. Sanitary procedures for processing.
   - Employees clean and sanitize hands, gloves, knives, other hand tools, cutting boards, etc., as necessary during processing to prevent contamination of products.
   - All equipment tables and other product contact surfaces are cleaned and sanitized throughout the day as needed.
   - Outer garments such as aprons and gloves are hung in designed areas when employees leave processing area.

- Outer garments are maintained in a clean and sanitary manner and are changed at least daily and more often if necessary.

2. **Monitoring and record keeping**
   - The Team Captains are responsible for ensuring that employees' hygiene practices, sanitary handling procedures and cleaning procedures are maintained.
   - The Team Captain monitors the sanitation procedures during the day.
   - Results are recorded on an Operational Sanitation Form daily.
3. Corrective action
   - The Team Captain identifies sanitation problems and stops production if necessary and notifies processing employees to take appropriate action to correct sanitation problems.
   - If necessary, processing employees are retrained and corrective actions are recorded on Operational Sanitation Form.

Annex IV. Dressing procedures for red meat species

1. General

No dressing procedure shall begin if there is any potential return to or signs of, a return to consciousness. Carcasses should be dressed after being suspended by the hind legs. Procedures, including sticking and bleeding, are conducted in a hygienic manner with measures to avoid contamination, including, but not limited to:

- ensuring that instruments/equipment are clean, and sanitized as necessary
- ensuring the carcass does not contact other carcasses before inspector veterinarian's approval
- ensuring bleeding does not happen in dry landing area and that blood is contained to a specific area
- avoiding having the carcass contacted with splashing from the floor or unhygienic structures
- avoiding letting the carcass contact the floor or unhygienic structures

- ❖ avoiding the transfer of heads over unprotected edible meat products unless effective controls (e.g. trays, pans) are in place to protect from cross-contamination
- ❖ ensuring skin and hide is cut from inside-out
- ❖ ensuring defects that may contaminate a piece of equipment will be removed prior to a procedure

Zero tolerance for contamination requires that any fecal, ingesta or milk contamination that occurs during dressing be removed, by trimming prior to the final carcass wash. Equipment should be cleaned and sanitized if it comes into contact with contamination (or parts that by nature can be considered contaminated/inedible), pathological defects or any biological hazards. Particular care in this matter should be taken for the following:

- ❖ sticking knives
- ❖ knives for splitting the brisket or opening the abdomen
- ❖ gutting presentation equipment (e.g. hooks, trays, tables)

Dedicated equipment/tools may be necessary (e.g. boots and apron for workers on moving table top. Cleaning and sanitizing protocols should also reflect the microbial risk associated with organic build up.

Once the carcass has been approved, any residual bone dust and blood must be removed prior to refrigeration, a final inside and outside carcass wash being the recommended means to achieve this.

2. Specific dressing procedures

2.1 Cattle dressing

- The lactating mammary glands and the mammary lymph nodes are removed.
- The penis and the prepuce are removed.
- The feet are removed prior to skinning the carcass: skin the area above and below where the leg will be cut.
- Head is removed, but if it is skinned and be left on the carcass, the horns are removed, as applicable, avoiding the opening of the skull.
- The hide is removed, proceeding from shackle downward and reflecting away from the carcass.
- The brisket and midline of the abdomen are opened after contamination has removed along the incision line.

- The bung (rectum) is dropped by performing a circular cut around anus, followed by ligation (by tie or clip) of the rectum and neck of bladder and then inserting into a plastic bag for dropping into pelvic cavity.
- The skinned head is removed (if not already removed before skinning); the head is thoroughly washed, including nasal and oral cavities, prior to any cuts.
- The tongue is dropped and palatine tonsils are removed to expose retro-pharyngeal lymph nodes.
- The oesophagus is separated from trachea and surrounding tissues (e.g.rodding) and tied-off before evisceration.
- The carcass is eviscerated.
- The carcass is split, except in the case of calves, after any contamination has been removed along the split line.
- The spinal cord is completely removed from carcasses of Over Thirty Months cattle before the final carcass wash.

2.2 Ovine and caprine dressing

- The lactating mammary glands and the mammary lymph nodes are removed.
- The penis and the prepuce are removed.
- The feet are removed prior to skinning the carcass: skin the area above and below where the leg will be cut.
- Head is removed, but if it is skinned and be left on the carcass, the horns are removed, as applicable, avoiding the opening of the skull.
- The skin is removed, proceeding from shackle downward and reflecting away from the carcass.
- The brisket and midline of the abdomen are opened after contamination has been removed along the incision line.
- The bung (rectum) is dropped by performing a circular cut around anus, followed by a step to mitigate any leaking from the rectum (such as tying off, use of a clip, intussusception, plugging) before dropping into pelvic cavity.
- The skinned head is removed (if not already removed before skinning); the head is thoroughly washed, including nasal and oral cavities, prior to any cuts.

- The tongue is dropped and the palatine tonsils are removed to expose retro-pharyngeal lymph nodes.
- The oesophagus is separated from trachea and surrounding tissues (e.g. rodding) and is tied-off before evisceration.
- The carcass is eviscerated

Annex V. Guidelines for Halal slaughter

What Is Halal?

The meaning of the word Halal is: "Permitted, allowed, authorized, approved, sanctioned, lawful, legal, legitimate or licit." When used in relation to meat or drink in any form whatsoever it means that it is permitted and fit for consumption by Muslims.

For a meat or drink to be described as Halal, it must conform to the Islamic dietary laws as specified in the Qur'an, the Hadith (sayings) of the Prophet Mohammad, his Sunnah (traditon) an in the fiqh (teachings) of the islamic Jurists: Hanafi, Shafi'i, Malki,and Hanbali.

For a product to be Halal it must be as a whole and in part:

- Free of, and not containing any substance or ingredient taken or extracted from a haram animal or ingredient.
- Made Processed, produced, manufactured and /or stored by using utensils, equipment and / or machinery that has been cleansed according to Islamic law,
- Must never have come into contact with, touch or be close to a haram substance during preparation, making, production manufacture, processing and /or storage.

Conditions:

The Conditions required for Halal slaughter of animals and birds are:

- The abattoir or factory must be under the close and constant supervision of a Halal Certifier.
- The premises, machinery and equipment must be cleansed according to Islamic Sharia (Law) before any production takes place.
- The Slaughter man must be a mature a pious Muslim of sound mind who understands fully the fundamentals and conditions relating to Halal slaughter and be approved by the religious authorities.

- Only acceptable live animals can be slaughtered.
- The slaughter must be done manually using a stainless steel knife.
- Facilities must be available for rinsing the knife after each kill.
- The slaughter man must sever the respiratory tract, oesophagus and jugular vein,
- The animal must be completely dead before skinning takes place.
- Only Halal animals are Hala slaughtered.

Halal manufacture

Islam is not a mere religion it is a way of life. There are rules and manners governing the individual Muslim. However, these are more than just rules of social courtesy. They are derived from broad objectives of Islam and reflect its ideas and values, hence, they have, for the Muslims, divine inspiration, while none of the general principles of faith can be changed, the precise details of the application of the rules may differ according to the fashions and circumstances of the local groups.

The true purpose of Islamic rules lies in its religious character, it derives from and sustains man's need to remember God and help him act rightly and correctly. Muslims are expected to eat for survival, to maintain good health and not to live for eating. In Islam, eating is considered to be a matter of worship of God like prayer, alma giving fasting and other religious activities. A Muslim eats to maintain a strong and healthy physique in order to be able to contribute his knowledge and efforts for the welfare of society, Muslims are supposed to make an effort to obtain meat of the best quality nutritionally.

Halal:

All meats are considered lawful in Islam unless specifically prohibited by the Qura'an or the Hadith. By official definition, Halal meats are those that are:

- Free from any component that Muslims are prohibited from consuming.
- Free from anything considered Najis (unclean) according to Shariah (law)
- Processed or prepared with apparatus or equipment free from things considered Najis (unclean).
- Processed or prepared with apparatus or equipment free from things considered Najis (unclean).
- Free from contamination while prepared or processed with anything considered Najis (unclean).

Haram:

According to the current Islamic thinking, the following are considered Najis and therefore Haram:

Animals and their Products:

- Dogs
- Pigs
- Insects considered ugly or filthy such as worms, lice, flies, etc.
- Animals with fangs such as tigers, lions, cats, etc.
- Birds that have talons with which they catch their prey such as owls, eagles, etc.
- Animals, which Islam encourage killing such as scorpions, centipedes, rates, etc.
- Animals, which Islam forbids to kill such as bees, etc.
- Animals that have toxins, poisons or produce ill effects when eaten such as some fish etc.....
- Amphibian animals such as crocodiles, frogs, etc.
- Meat that have been cut from a live animal such as limbs, tails, etc.
- Lawful animals not slaughtered according to Islamic rites. Fish is exempt from slaughtered according to Islamic rites. (Fish is exempt from slaughtering).