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دليل الممارسة الصحية لتجهيز ونقل
وتداول وتخزين اللحوم الطازجة

**Code Of Hygienic Practice For
Preparation, Transportation,
Handling And Storing Of Fresh Meat**

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FOREWORD

The objective of this standard is to provide set of principles that, if applied, can ensure that meat is produced according to Islamic rules, in hygienic manner, from healthy animals and that the meat proved to be fit for human consumption is not subsequently treated in any way which may be detrimental to its quality or wholesomeness during dressing, transportation, storage or handling.

CODE OF HYGIENIC PRACTICE FOR PREPARATION, TRANSPORTATION, HANDLING AND STORING OF FRESH MEAT

1- SCOPE AND FIELD OF APPLICATION

This standard is concerned with a code of hygienic practice for preparation, transportation, handling and storing of fresh meat. It applies to the abattoirs, custom slaughterhouses, establishments and retail outlets of meat.

2- COMPLEMENTARY REFERENCES

- 2.1 GSO 21/1984 “Hygienic Regulations for Food Plants and Their Personnel”.
- 2.2 GSO 149/1993 “Unbottled Drinking Water”.
- 2.3 GSO 593/1995 “Meat and Meat Products - Physical Tests”.
- 2.4 GSO 714/1997 “Transportation Regulations of Livestock by Rail, Road and Ships - Part 1: Transport of Sheep and Goat”.
- 2.5 GSO Standard on “Transportation Regulations of Livestock by Rail, Road and Ships - Part 2: Transport of Cows and Buffaloes”.
- 2.6 GSO Standard on “Animal Slaughtering Requirements According to Islamic Law”.
- 2.7 GSO Standard on “Meat and Meat Products - Chemical Tests”.

3- DEFINITIONS

- 3.1 Abattoir
Premises, approved and registered by the concerned controlling authorities for the slaughter and dressing of animals for human consumption.
- 3.2 Brand
Any mark or stamp, approved by the concerned controlling authorities and directly placed upon carcasses and their products.
- 3.3 Contamination
The direct or indirect transmission of an objectionable matter.
- 3.4 Concerned controlling authority
The official authority, charged by government with the control of meat hygiene, including meat inspection and the treatment of slaughter animals.

- 3.5 Custom slaughterhouse
Premises, approved and registered by the controlling authority, where private individuals can have their own animals slaughtered and dressed, after inspection, for consumption by themselves or their families.
- 3.6 Clean surface
A dry smooth surface that is free from visible contamination, oxidation and noticeable odour and on which no grease can be detected with dry clean fingers.
- 3.7 Dressing
The removal of the hide or skin, viscera (including or not including heart, liver or kidneys), genital organs, urinary bladder, feet up to the carpal and tarsal joints, and uders of lactating animals, or animals that have given birth or that are in an advanced state of pregnancy. Dressing may or may not include removal of the head and splitting the carcass in the midline.
- 3.8 Edible
Fit for human consumption.
- 3.9 Edible offal
In relation to slaughtered animals, means such offal as have been passed as fit for human consumption.
- 3.10 Establishment
Any premises approved and registered by the concerned controlling authority, in which fresh meat is prepared, handled, packed or stored.
- 3.11 Inspector
A qualified veterinarian who has been appropriately trained in meat hygiene and who is appointed by the concerned controlling authority for the purpose of controlling animal welfare, meat inspection and relevant hygienic conditions.
- 3.12 Meat
The edible part of any mammal which is lawful for Muslims to eat in accordance with the GSO standard mentioned in 2.6 and which has been produced from an animal slaughtered in an abattoir or custom slaughterhouse in accordance with the same standard.
- 3.13 Potable water
Drinking water that is pure and healthy at the point of usage, and meets requirements of the GSO standard mentioned in 2.2.
- 3.14 Protective clothing
Special garments intended to prevent the contamination of meat or personnel and used as an outer wear for persons who are engaged in, or visiting, an area in an abattoir, a custom slaughterhouse, an establishment or in any meat retail outlet where meat is being handled. It includes head covering and footwear.

- 3.15 Refrigeration and relative humidity
The enforced decrease in meat temperature to the refrigeration degree (-0.5 ± 1), provided that the humidity degree be within (90% - 95%).
- 3.16 Retail outlet
Any facility where meat is offered for sale to consumers, i.e. market, supermarket, or butcher's.
- 3.17 Sanitizer
A substance used for killing the viable microorganisms on the clean surfaces to a level commensurate with product quality and safety without adversely affecting meat products.
- 3.18 Sanitized surface
A clean sanitized surface which is substantially free from pathogenic microorganisms and undesirable numbers of spoilage organisms.
- 3.19 Manager
A trained person with experience as specified by regulations and approved by the concerned authority. He is responsible for the management of an abattoir, a custom slaughterhouse, an establishment or a retail outlet.

4- LAYOUT AND CONSTRUCTION OF ABATTOIRS, CUSTOM SLAUGHTERHOUSES, ESTABLISHMENTS AND RETAIL OUTLETS

- 4.1 General requirements
- 4.1.1 Location, layout and construction approval
Location, layout and construction need to be approved by the concerned controlling authorities.
- 4.1.2 General layout shall:
- Ensure effective separation of edible and inedible materials;
 - Allow for efficient and effective performance of all operations;
 - Facilitate effective supervision of meat hygiene, meat inspection and product quality control;
 - Ensure that meat comes into contact with only those surfaces that are specifically designed for such contact.
- 4.1.3 General construction
Buildings and facilities shall be sound, adequately ventilated, provided with good lighting and can be easily cleaned.
- 4.1.4 Ceilings, walls and floors
Ceilings and walls shall have light-coloured, impervious surfaces that can be easily cleaned and sanitized. All joints shall be tightly sealed and all joints between walls and floors shall be coved to facilitate cleaning.

- Ceilings and ceiling fittings shall be so designed and constructed as to prevent accumulation of dirt and condensation.
- Floors shall be constructed of durable, water resistant, nonabsorbent, non-toxic and easy to clean materials. The surface shall be non-slip, even and free from crevices to facilitate draining so that pooling of water is avoided.
- Doors shall have hard, smooth, impervious, washable surfaces, they shall be tight fitting and can be automatically closed.

4.1.5 Lighting

Adequate lighting shall be provided throughout the remaining processing areas and at inspection points. The intensity of light shall not be less than:

540 lux at all inspection points;

220 lux in work rooms;

110 lux in other areas.

The accessories of lighting used over the unwrapped meat shall be of the safe kind.

4.1.6 Ventilation

Ventilation systems for buildings shall be adequate to control temperature within acceptable limits. The air circulated shall be free from dust, odours and vapour. Windows cannot be possibly opened in any building used for the processing or storage of meat. Also there shall be no permanent openings directly to the outside of the building. Access doors shall be where possible, self closing and provide an airlock to prevent ingress of dust, odours, vapour and other contaminants. The path of air flow shall be from edible to inedible areas.

4.1.7 Water supply

- Potable water shall be distributed throughout the facility under adequate pressure. The water supply shall be effectively protected from dust, dirt and other sources of contamination. Where a facility-based water treatment plant is required to ensure that a continuous supply of potable water is available, such plant should be of the automatic type.
- In addition to cold water, an adequate supply of hot potable water is required to be supplied throughout the facility.
- A minimum temperature of 82°C at point of use is required for water used for sanitation purposes. An effective water temperature control and monitoring system shall be installed and maintained in service.
- Non-potable water may be used for such purposes as producing steam, or fire control.
- The potable water system shall be clearly identified and completely separated from any other water or liquid transfer systems.
- An adequate hot and cold potable water supply shall be provided at all work stations and amenities for personnel hygiene requirements. Amenities include toilets, wash rooms and changing rooms.

4.1.8 Drainage and waste disposal

- These systems shall be approved by the concerned controlling authorities.
- The whole site shall be well-drained to prevent flooding and the pooling of surface water.
- Effluent and waste disposal systems shall be efficient, and well maintained. All effluent lines must be large enough to carry peak loads, be water-tight and adequately trapped and vented. Effluent pumps and collection points shall be kept outside any department in which meat is prepared, handled, packed or stored.
- The effluent disposal system shall be identifiably separated from the potable water supply, and shall provide no opportunity for cross contamination to it. The drainage system shall be connected with an adequate sewerage system and shall meet local regulatory requirements. Lines from toilets shall not be connected with any other drainage system within the facility.
- Floor inlets to the drainage system shall be covered with a grill or similar barrier to prevent pests gaining entry to the rooms.
- A general refuse and waste collection and disposal system shall be provided. The system shall ensure that the waste materials are separated from edible products. Collection and temporary waste storage areas shall be situated away from edible processing and storage areas and be designed to prevent cross contamination and environmental nuisance.
- The equipment, containers and methods used for handling and transportation of the waste products and inedible materials shall be designed and maintained to isolate such materials from edible products.
- The storage and processing facilities for animal waste products and inedible materials shall be physically separated from edible product processing and storage areas, and so designed as to prevent cross-contamination and environmental nuisance.

4.1.9 Pests control and rodents

All enclosed buildings shall be proofed against the entry and harbouring of pests (i.e. birds, flies and cockroaches) to prevent the spread of contamination and disease.

4.1.10 Equipment and plant

- Equipment and utensils installed or used in meat processing areas shall be manufactured from non-corrosive, impervious to water materials that do not taint meat and can be easily cleaned and sanitized.
- Cutting boards shall be capable of being resurfaced regularly to facilitate cleaning.
- Wooden materials are not acceptable in areas where meat is handled, prepared, packaged or stored.
- A sufficient number of facilities should be provided close to each work station for hand washing, and for the cleaning and sanitization of equipment in accordance with this standard. Taps shall be knee or foot operated. Hand

washing facilities shall have warm running water, premixed to suitable temperature, approved soap plus disposable hand towels.

- Facilities for sanitization of tools shall be supplied with water at not less than 82°C or with 50 ppm chlorine solution.
- Refrigeration systems shall have adequate capacity with control systems to meet the peak requirements for each department or storage area.
- Refrigeration systems shall supply clean air. Condensate from refrigeration units shall be piped directly out of the processing or storage rooms to prevent its falling upon meat and contaminating its surfaces.
- The equipment used for disposal of refused meat and inedible parts shall be well designed.

4.1.11 Staff amenities

An adequate number of changing rooms with smooth, impervious, washable walls, ceilings and floors, wash basins, showers and flush lavatories shall be provided. The lavatories shall not open directly onto work rooms or storage areas. Wash basins shall have knee-or-foot-operated taps with pre-mixed warm water at a suitable temperature and approved soap. Hand towels shall be disposable and used once only.

- Adequate separate staff amenities should be provided for inspectorial staff.
- First aid facilities shall be provided for all staff.
- No store room or bedroom shall be used for processing meat.
- Eating facilities or bedrooms shall be divorced from processing and storage areas.

4.1.12 Maintenance

All site facilities, buildings and equipment shall be kept well maintained at all times.

4.2 Specific requirements for abattoirs

The receiving and lairage system shall ensure that live animals are subject to a minimum of stress, kept clean, inspected by a veterinarian and their source identity maintained. The slaughter and dressing system shall minimize contamination of, and cross contamination between carcasses and allow post-mortem inspection.

4.2.1 The animal receiving area

Ramps shall be provided for the unloading of animals from transport vehicles. The ramps shall be adjustable to a maximum of 30° from the horizontal, there also shall be flooring and guide rails that present no hazards to the animals.

4.2.2 Cleaning of livestock transport vehicles

The unloading area shall include a separate facility for cleaning livestock transport vehicles.

4.2.3 The lairage

It shall be covered, of sound construction, with adequate ventilation and good lighting, easy to clean, well drained and acoustically designed to aid quietness.

The lairage, unloading area, and races shall be provided with an adequate water supply to enable them to be cleaned.

4.2.4 Holding pens

The pens shall be so constructed as to minimize bruising and injury to animals. Round corner posts shall be used and protruding bolts, nuts and wires avoided. Each pen shall have an adequate water supply and a feeding trough. Ideally the flooring shall be of a smooth mesh raised above a concrete base, to enable the faecal matter to fall clear of the animals.

- The holding pen layout shall be so designed as to enable stock identity to be maintained and that cross traffic of animals of different species is avoided. Area of each pen shall be limited on the base of 3.3 m² for each cow and 0.7 m² for each sheep or goat and 4 m² for each camel.
- The holding pens shall be covered so as to protect animals against the sun strokes.
- A lairage designated for the initial inspection of animals shall be provided with an adequate sized, clearly separated area for the isolation of suspect or diseased stock. Covered restraining facilities shall be provided to allow for close examination of animals when necessary.
- A facility should be provided for the killing and final disposal of condemned stock without entry into any room or facility used for the handling of edible products.

4.2.5 Transfer to slaughter room

The way from the lairage to the slaughter room shall be enclosed and designed to allow a single line of animals to quietly progress to slaughter.

4.2.6 The slaughter room

The layout shall conform to Islamic requirements so as to have the work carried out in a satisfactory manner. The equipment should be so designed as to minimize animal stress; to automatically restrain the animals in the defined attitude for slaughter, then to have them positioned immediately after the

slaughter cut in such a way that the discharge of blood does not add to the contamination of the carcass and pelt. The slaughter room layout and equipment shall cater for a continuous process with a clear physical separation between animals to provide due opportunity for the full and proper rites of slaughter to be obeyed, and to minimize cross contamination.

4.2.7 Facilities for emergency slaughter

There shall be provisions made for emergency slaughter of animals that are physically incapable of passing through the normal slaughter system, provided that the ante-mortem inspection has found no signs of any disease that would prevent the use of the meat for human consumption. The emergency slaughter facilities shall allow slaughter, dressing and post-mortem inspection to be carried out under hygienic conditions. If the meat from an emergency slaughtered animal is passed for human consumption, it shall be transferred to normal processing areas without being exposed to contamination.

4.2.8 Holding rails

Slaughter and dressing rooms, refrigerated rooms and transfer corridors shall have carcass holding rails of sufficient height and positioned away from walls to prevent any part of carcasses from touching floors or walls. The rails system shall be so designed that carcasses or parts thereof cannot come into contact with each other prior to post-mortem inspection.

4.2.9 Carcass dressing

The carcass dressing room shall be provided with effective means of physical separation of edible and inedible material, with the minimum possible risk of cross contamination between carcasses.

- Slaughter room equipment shall minimize the opportunity for faecal material from the pelt to contaminate the carcass surface.
- A room shall be provided for emptying and cleaning of digestive organs, with a separate room for the further processing of the organs.
- Separate individual rooms shall be provided for the storage of hides, horns and hooves if the holding period extends beyond one day.

4.2.10 Post-mortem inspection

- The inspection point shall be of adequate size and have lighting that complies with (4.1.7). It shall be provided with adequate facilities for the meat inspection services. A local refrigerated room or refrigerator or freezer shall be provided to hold carcasses for which final post-mortem judgement has to be deferred until the results of further veterinary tests become available.
- Each abattoir shall contain a laboratory for veterinary tests

4.2.11 Refrigerated storage and holding areas

Carcass holding rooms or refrigerated storage rooms, that are separate from the slaughter and dressing areas, shall be provided. The refrigerated storage areas shall provide an effective drying and cooling environment for meat required to be stored for further processing. The holding area or room where carcasses are held for the hot meat trade shall be so equipped as to maintain meat surfaces dry.

4.2.12 Corridors and transfer areas

When used for transfer of uncovered meat, these areas shall be designed and constructed to comply with the requirements mentioned in 4.1.4, 4.1.5, and 4.1.6. The layout of the plant shall be such that at no time should uncovered meat products, being transported between rooms, be exposed to the environment outside the plant.

4.2.13 Edible product unloading

The unloading facility shall be suitably screened to minimize cross contamination between products and contamination from the environment surrounding the plant. The product transfer system shall be so designed as to minimize the time of the product presence in the unloading facility.

4.3 Specific requirements for custom slaughterhouses

(In addition to requirements mentioned in 4.1).

4.3.1 Entry to slaughter

At the entry point to the slaughterhouse there shall be a designated ante-mortem inspection room, clearly separated from the slaughter area and other facilities. All floors shall be non-slip and washable (see 4.1.6).

4.3.2 Slaughter area layout

The slaughter area shall be physically separated from the customer waiting area by a solid wall not less than 1 metre high.

- Facilities shall be so designed as to minimize animal stress.
- Provision shall be made for the collection and removal of blood.
- There must be a sufficient separation between slaughter stations to allow the entry of slaughter animals and the removal of waste material without contamination of exposed meat surfaces.
- There shall be a lockable, temperature-controlled facility to hold those carcasses that have been detained during post-mortem inspection, where further examination is required before final judgement can be made.

4.3.3 Carcass dressing

Suitable equipment shall be provided to enable the entire dressing procedure to be completed with the carcass in the hanging position without contact with floor, ceiling or walls.

- Inedible material shall be removed from the dressing area and stored in a separate clearly isolated room or in closed containers.

4.3.4 Carcass cutting for consumers

Cutting area and its equipment shall enable the carcass to be broken down in a hygienic manner into the cuts required by the consumer.

4.3.5 Packaging

Meat packaging materials shall be stored in a suitable hygienic, and unarmful method. Packaging shall be carried out in a room separate from the slaughter and dressing areas.

- The system shall minimize the risk of contaminating the meat by packaging materials.

4.4 Specific requirements for establishments

(In addition to requirements mentioned in 4.1).

4.4.1 Receiving and unloading facilities

These areas shall be designed to prevent the contamination of the product. They shall also protect the product from the environment surrounding the establishment.

4.4.2 Refrigeration capacity

The capacity shall be sufficient for the intended placing and storage of the product.

4.4.3 Cutting boards and chopping blocks

These shall be of materials that can be easily cleaned with smooth surfaces. The use of wood for this purpose is prohibited.

4.5 Specific requirements for meat retail outlets

(In addition to requirements mentioned in 4.1.).

4.5.1 Processing area

This area shall satisfy the specific requirements for establishments (4.4).

4.5.2 Consumer access

There shall be a physical barrier separating consumers from areas where raw meat is prepared and packaged and also from raw unwrapped meat on display. Consumer self-service cabinets should only hold wrapped meat products.

4.5.3 Display refrigerators

The display refrigerators shall be capable of holding products, consistently at temperatures that will provide adequate display life.

4.5.4 Lavatory facilities

Adequate facilities shall be provided for staff. No entrance to such lavatories may open directly into areas used for the processing or open display of meat. Hand washing facilities complying with 4.1.13 shall be provided.

5- CONSTRUCTION OF VEHICLES FOR TRANSPORTATION OF LIVESTOCK FOR SLAUGHTER

5.1 Construction

Vehicles used for the transportation of slaughter animals shall be of a suitable and durable construction that allows easy cleaning and reduces animal bruising to a minimum without prejudice to what has been stated in the GSO standards mentioned in 2.4 and 2.5.

5.2 Loading of animals

Vehicles shall be equipped with suitable ramps to allow easy loading or unloading of animals so that stress on animals is minimized.

5.3 Animal restraint

Vehicles shall have tying points or partitions to restraint animals during transport.

5.4 Partitions

Vehicles shall be fitted up with partitions, when the space available is greater than 3.1 m in length for sheep and goats and 3.7 m for cattle and camels, to form pens not exceeding 3.1 m and 3.7 m, respectively in width.

5.5 Flooring

Floors shall be of a non-slip type to prevent animals from falling during transportation, thereby minimizing animal injury and soiling of the animals with faeces and urine. Floors should be self-draining to minimize the accumulation of urine and faeces.

5.6 Multi-tiered vehicles

There shall be sufficient headroom to allow the animals to stand upright and to allow sufficient ventilation.

- The tiers shall be separated by impervious floors to prevent animals on the lower decks being soiled with faeces and urine from animals on the upper decks.
- The urine and faeces from the floors of the upper deck shall be channelled and piped away from the animals on the lower deck.

5.7 Screening of animals

Vehicles shall be suitably equipped so as to screen the animals from exposure to the weather changes.

6- CONSTRUCTION OF VEHICLES FOR TRANSPORTATION OF MEAT AND/OR OFFAL

6.1 Construction

Vehicles for the transportation of meat shall be of the closed container type.

- All internal surfaces and fittings shall be made of corrosion and rust-resistant materials, that are smooth, impervious and easy to clean and sanitize. Joints and doors shall be sealed so that the entry of pests and other sources of contamination is prevented.

6.2 Humidity and temperature control

6.2.1 The design of the container shall be such that the required temperature and/or surface dryness of the meat can be controlled throughout the whole period of transport.

6.2.2 The refrigerator shall be provided with a thermometer mounted in such a way as to make it easy to read the temperature from outside the refrigerator.

6.3 Storage of meat

Vehicles intended for the transport of meat or offal shall be equipped in such a way as to prevent unwrapped meat from coming into contact with the vehicle's floor, walls or ceiling.

6.4 Transportation of offal

Suitable closed containers shall be used for the transport of unwrapped offal. Offal shall be transported under refrigeration unless the period of transportation is less than two hours, in which case a separate container may be used.

7- OPERATING REQUIREMENTS FOR ABATTOIRS, CUSTOM SLAUGHTERHOUSES, ESTABLISHMENTS AND RETAIL OUTLETS

7.1 Transportation of animals for slaughter

Without prejudice to what is stated in the GSO standards mentioned in 2.4 and 2.5, vehicles not complying with item 5, shall not be used for carrying animals.

- 7.1.1 Segregation of animals
Animals of different species or of grossly unequal size shall be separated during transport.
- 7.1.2 Transportation of unfit animals
Animals that are diseased, injured or in an advanced state of pregnancy, are not permitted to travel.
- 7.1.3 Feeding during transportation
During long journeys, adequate feed and water shall be offered to the animals every 12 hours at least except when the transportation period is to be completed within 15 hours from the last feeding.
- 7.1.4 Space requirements
Overcrowding of animals which could result in injury or unnecessary suffering is forbidden. Animals shall stand close enough to support each other, but not so close that they squeeze each other. A floor space during road transport of 0.17 - 0.25 m² for each sheep or goat, depending on size, and 1.2 - 1.4 m for cattle or camel is required.
- 7.1.5 Cleaning of vehicles
Animals shall only be transported in vehicles that have been cleaned and disinfected before loading and after unloading.
- 7.1.6 Animal handling
To avoid bruising and stress, animals shall be treated with care during loading and unloading.
- 7.1.7 Animal identification
A means for identifying animals at the point of loading into transport vehicles and during transportation, as to the source of supply or ownership and a record shall be kept to this effect. Animals from different sources of supply or ownership, transported in the same vehicle shall be kept physically separated.
- 7.2 Preslaughter holding and slaughter
- 7.2.1 Animal identity
- Animals shall be identified on arrival at the abattoir according to source or ownership. Animals of different identities should be kept separate from each other.
 - The system of identification shall permit the identity to be maintained after dressing.
 - Different species of animals, e.g. cattle and sheep, shall be kept in separate pens.
- 7.2.2 Antemortem inspection
- The animals shall be subjected to antemortem inspection by a veterinarian not more than 24 hours before slaughter, in accordance with the appropriate regulations and the GSO standard mentioned in 2.3 and 2.7.

- Animals suspected of being diseased shall be identified accordingly and separated from healthy stock. They shall be slaughtered at the end of the work period or in an area specially prepared for this purpose.
- The postmortem inspector shall be notified of all suspected animals so that he can pay particular attention to their carcasses on inspecting them.
- Animals found to be suffering from a condition that would make the meat unfit for human consumption, shall be disposed of humanely without entering the slaughter system, and identified as condemned (7.3.5).
- The disposal system for such animals should be such that it contains no risk, at any time, of transferring contamination or disease to people and edible products.

7.2.3 Animals handling

- During preslaughter holding and marshalling for slaughter, animals shall be treated quietly and gently to minimize stress and bruising.
- The hitting of animals shall be kept to a minimum, the use of heavy wooden sticks and metal bars for this purpose is prohibited. The use of electric prodders shall be kept to a minimum (the voltage shall not exceed 50 V).

7.2.4 Cleaning

Lairages shall be washed clean at least daily to remove animal faeces, urine and other materials that may serve as a breeding ground for pests.

7.2.5 Slaughtering

Slaughtering shall be carried out according to the GSO standard mentioned in 2.6.

7.3 Hygienic regulations

Without prejudice to what is stated in the GSO standard mentioned in 2.1, the construction and maintenance of plant and equipment shall comply with the recommendations in item 4.

7.3.1 Hygienic of personnel

All personnel who will come into contact with meat at abattoirs, custom slaughterhouses, establishments, retail outlets or during transportation shall be subjected to a medical examination prior to employment and every 6 months thereafter or as epidemiologically indicated. The medical examination shall pay particular attention to:

- 1- Wounds and infectious sores;
 - 2- Enteric disease, including parasitic infestations and carrier cases of bacterial diseases, especially salmonella; and contagious diseases such as Tuberculosis and Brucellosis.
 - 3- Respiratory diseases.
- Persons, suffering from wounds or infectious sores or from diarrhea, shall not be permitted to come into contact with meat.
 - Persons who are cut or injured shall be stopped from handling meat until they have been suitably bandaged. Bandages shall be waterproof, of a conspicuous

colour, e.g. bright blue or green, and of a nature that prevents them from becoming accidentally detached.

- Every person engaged in handling meat at an abattoir, custom slaughterhouse, establishment, retail outlet or meat transport shall wash his hands with running, warm water and approved soap before commencing work. The person shall also wash his hands immediately after using the lavatory, after handling contaminated, diseased or suspect materials, or whenever else it is seen to be necessary.
- Every person engaged in an area of an abattoir, custom slaughterhouse, establishment or retail outlet where meat is being handled or who is engaged in the transportation of meat, must have a high standard of personal cleanliness. While on duty he shall wear suitable, preferably white, protective clothing, including head covering and footwear, which shall be maintained in a clean condition.
- Gloves worn by any person handling unwrapped meat shall be made of an impermeable material, and be kept clean and in good repair without holes. The wearing of gloves does not exempt the person from having to thoroughly wash his hands.
- Personnel handling unwrapped meat shall not wear rings or wrist-watches, if these are likely to come into contact with the meat.
- Special equipment, such as knives, knife pouches, sharpening steels and belts shall be of impervious material, be easy to clean and shall be kept in a good state of repair.
- All kinds of behaviour which can potentially contaminate meat, such as the use of tobacco, eating, chewing gum or spitting, in areas where meat is being handled or stored shall be prohibited. The manager of the abattoir, custom slaughterhouse, establishment or retail outlet will ensure that the GSO standard mentioned in 2.1 and the hygiene of personnel are being adhered to.

7.3.2 Hygienic operating conditions

7.3.2.1 Cleaning and sanitation during operation

All equipment, including knives, which come into contact with meat at abattoirs, custom slaughterhouses, establishments, or retail outlets shall be washed and sanitized at frequent intervals during processing. The equipment shall be immediately and thoroughly cleaned and sanitized when it has come into contact with a diseased or contaminated material. Sanitization is carried out by applying water at 82°C for not less than 30 seconds or with water containing 50 ppm chlorine for 2 minutes.

- In abattoirs and custom slaughterhouses, all carcasses which have not yet passed postmortem inspection, shall be regarded as potentially diseased. After handling any such carcasses, hands shall be washed and equipment cleaned and then sanitized. This cleaning and sanitation procedure shall not contaminate carcasses or meat.
- Equipment and utensils used for inedible or condemned materials should be identified accordingly and shall not be used for edible products.

- Equipment and utensils, used for slaughtering and processing, shall not be used to cut, unbone and dress meat.
- In case equipment or utensils, used in an edible department, enter a department where inedible or condemned material is handled, it shall be thoroughly cleaned and sanitized immediately before re-entering the department where edible product is handled.
- The floors of processing rooms shall be kept substantially free from discarded materials, during processing.

7.3.2.2 Daily clean-up procedures

- At the end of processing, all equipment as well as the processing rooms shall be thoroughly cleaned using potable water and approved detergents. Equipment shall be sanitized using counter-microorganisms compounds or by heat. The procedures shall conform to the following general pattern:
 - Cleaning with brooms followed by a hose down to remove loose materials.
 - Cleaning, combining the use of a detergent with physical action, for example manual scrubbing or the use of high-pressure water jets.
 - Rinsing to remove detergent residues.
 - Sanitizing to reduce the number of microorganisms left on the surfaces.
 - Rinsing to remove sanitizer residues.
 - Drying to prevent microbial growth on the surface in the period before reusing the equipment.
 - Immediately before processing is resumed, equipment should be rinsed with potable water.

7.3.2.3 Control of chemicals, pests and waste

- Only suitable and safe cleaning preparation or materials or paints shall be used in abattoirs, custom slaughterhouses, establishments or meat retail outlets where any animal is or may be slaughtered or dressed, or where meat is or may be prepared, handled, packaged or stored.
- No substance, which may contaminate meat, should be handled or stored in any part of a premises where animals are or may be slaughtered and dressed or where meat is prepared, handled, packaged or stored, unless this is required for purposes of hygiene. If such substances are essential for purposes of hygiene, then a stringent approved method of control is to be imposed on the handling and storage of such substances.
- The entry of insects, birds, rodents and other pests into abattoirs, custom slaughterhouses, establishments and retail outlets shall be prevented at all times. Premises should be examined regularly for evidence of such infestation. Proof in the form of records of such inspection shall be maintained by the facility's manager.
- If pests do gain entry, approved eradication procedures shall be instituted. Only pesticides approved for use in abattoirs, custom slaughterhouses, establishments or retail outlets shall be used. Before pesticides are applied, all

meat shall be removed from the room and all equipment covered. After spraying, all equipment shall be thoroughly washed before being used again.

- No animals other than animals for slaughter should be allowed to enter any part of an abattoir or custom slaughterhouse. No animals shall be allowed to enter establishments or retail outlets.
- All waste products and inedible materials shall be stored away from areas where edible product is handled in abattoirs, custom slaughterhouses, establishments or retail outlets.
- Only closed containers or rooms shall contain the storage of waste products and inedible materials in order to prevent pests as well as offensive odours from gaining entry into areas where edible products are processed. The containers and rooms shall be cleaned at frequent intervals to remove all materials which can serve as a breeding ground for pests.

7.3.2.4 Responsibility for operating conditions

The manager of the abattoir, custom slaughterhouse, establishment or retail outlet shall ensure that the procedures for maintaining hygienic operating conditions are being adhered to.

7.3.3 Hygienic slaughter and dressing

Every animal intended for slaughter must undergo ante and postmortem inspection. No animal shall be slaughtered or dressed in any abattoir or custom slaughterhouse without an inspector's approval.

7.3.3.1 Slaughter hygiene

Animals that are in an unreasonably dirty condition shall be cleaned in a manner which will lessen the risk of contamination before they are allowed to enter the slaughtering room.

- Any animal brought into the room of slaughter shall be slaughtered without delay. The rate of slaughter shall not exceed the level at which the carcasses can be accepted for dressing.
- The slaughter process shall be made with the animal resting on a table or a low cradle, so that contaminants from the floor do not enter the wound.
- Before carcasses are hoisted into a hanging position, the esophagus shall be clipped or tied, to prevent leakage of ruminal contents.

7.3.3.2 Dressing hygiene

No part of carcass should be allowed to touch the floor or the walls. Carcasses and parts thereof should be prevented from touching each other once the slaughter has been made. The separation of carcasses should be maintained until they have been examined by the inspector

- The skinning operation should only be carried out with animals in the hanging position. The skinning procedure should prevent contamination being transferred from the hide or skin to the exposed surface of the meat. The carcass should be completely skinned before evisceration commences. If the head is left attached to the carcass, or if any head meat, the tongue or the brain

is recovered, the head must also be skinned. Pumping air between the skin and the carcass is prohibited unless by a hygienic method.

- Lactating or obviously diseased udders shall be removed at the earliest appropriate time during dressing. No secretion is to be allowed to contaminate the surface of the carcass.
- Evisceration must be carried out in a manner that prevents contamination of the carcass with the content of abdominal organs. The anal sphincter should be circumcised and the rectum tied before it is dropped into the pelvic cavity and the digestive track removed without incising the stomach or intestine. The gall bladder, the urinary bladder and sexual organs shall be carefully removed, avoiding contamination of the carcass with their secretions.
- In custom slaughterhouses, the selection of slaughter station shall progress sequentially so that the cutting of a dressed carcass does not take place adjacent to a position where an animal is being prepared for slaughter, to prevent cross contamination.
- In custom slaughterhouses, consumers should not enter the slaughter and dressing area unless they wear suitable approved protective clothing, including footwear.

7.3.3.3 Removal of inedible materials

No inedible materials, (including offal or skin) should be left in the room where dressing takes place, but should be continuously removed without causing contamination of the edible product. All stomachs and intestines should be removed from the room as soon as possible, but in accordance with meat inspection procedures. They should be treated in parts of the premises designated for this purpose, in accordance with practical practices which should take into account hygiene and cleanness purposes. Recycling of wastes is allowed.

7.3.3.4 Removal of objectionable matter form the edible product

- Edible offal should be so handled as to avoid contamination. They should be washed only with running potable water.
- Faecal or other objectionable matter that may contaminate carcasses or edible offal during processing should only be removed by careful trimming. If carcasses are to be washed for any reason, only running potable water should be used. When washing is carried out prior to evisceration, water should not be allowed to enter the thoracic or abdominal cavities. No paper, cloth, wad, sponge or brush should be used in washing carcasses.

7.3.3.5 Supervision of process hygiene

If the inspector considers that the way in which animals are being slaughtered or dressed or the way in which meat is being prepared or handled will have an adverse affect on:

- Animal health welfare, or
- The cleanliness of the carcass or the meat; or

- The hygiene and safety of the production process; or
- The efficiency of meat inspection.

He shall direct the manager of the abattoir or that of the custom slaughterhouse to correct the deficiency, to reduce the rate of production or to suspend operations in the relevant section of the premises.

- The manager of the abattoir or that of the custom slaughterhouse is responsible for ensuring that the procedures for hygienic processing are being followed.

7.3.4 Meat inspection

All animals, slaughtered in abattoirs or custom slaughterhouses, shall be subjected to ante and postmortem inspection according to the GSO standards mentioned in 2.3 and 2.7 in addition to what is mentioned in 7.2.2 of this standard.

- Postmortem inspection should be carried out immediately after slaughter. Prior to final inspection, all parts required for the examination of the animal should remain identifiable with the carcass. No parts of an animal shall be removed from the slaughter rooms, before the final inspection, without the consent of the inspector.

7.3.5 Meat branding

All parts of the carcass which have been passed as fit for human consumption and which are intended for sale should be branded with an official mark, using either firebrand or an approved ink which is harmless and easily adheres to the surface. The stamps which should be kept clean, shall be held in the custody of and only used under the supervision of the inspector. The official mark shall indicate the date, type of carcass, source of the meat and the abattoir.

7.3.6 Condemned meat

- Strict measures shall be taken to ensure that condemned meat does not enter the food supply system.
- Meat that is condemned unfit for human consumption or otherwise rejected, should forthwith be placed in a clearly identified container or room and held under supervision of the inspector. Such meat shall be identified as condemned and unfit for human consumption by the use of special brands or ink of a particular colour, e.g. green, or denaturing substances e.g. kerosene or a phenolic compound.
- The inspector shall ensure that condemned meat brand cannot be removed or that the meat cannot act as a source of contamination during transport to the place of final disposal.
- Condemned and rejected meat and other waste materials shall be removed at least once daily to the place of final disposal.
- No person should remove or cause to remove any carcass or part of a carcass which has been condemned or retained by the inspector, except under the inspector's supervision.

- It is the responsibility of the manager to ensure that meat found to be unfit for human consumption is removed to the place of final disposal in accordance with the rules of the concerned controlling authority.
- Meat identified as being unfit for human consumption due to disease shall be incinerated or rendered in accordance with the regulations of the controlling authority.

7.4 Handling of meat

Meat passed as fit for human consumption shall at all times be handled, stored and transported in a manner that will protect it from contamination and deterioration.

7.4.1 Storage of meat

Meat passed as fit for human consumption shall be removed without undue delay from the dressing area. It shall be placed in a holding area under conditions where a combination of relative air humidity, airflow and temperature acts to restrict microbial growth on the meat. The entry of individuals to meat holding areas should be limited to those necessary for efficient operation.

7.4.1.1 Storage without refrigeration

When whole carcasses, sides or quarters are intended to be stored or transported (preferably to be refrigerated), the following conditions shall apply:

- The meat shall not be wrapped in moisture-impermeable wraps.
- The carcasses shall be hung, without touching each other or the walls, ceilings and floors to permit adequate flow of air around the meat.
- The relative humidity and the airflow shall be adequate to ensure a dry meat surface. The application of water to meat after the final inspection is prohibited.
- The maximum period during which meat is held without refrigeration shall be limited to 6 hours from the time of slaughter.
- A record shall be kept of the source, time and date of all meat placed in or taken out of storage place.

7.4.1.2 Refrigerated storage

When carcasses, parts of carcasses or edible offal, are placed in refrigerated storage, entry to the storage shall be restricted to personnel whose presence is necessary to carry out operations efficiently. The temperature shall be controlled at $(-0.5 \pm 1)^{\circ}\text{C}$.

7.4.1.2.1 Environmental control

- To ensure an adequate rate of reduction in the meat temperature, doors shall not be left open for extended periods and they shall be closed immediately after use. No refrigerated storage facility shall be loaded beyond its designed capacity.

- If refrigerating equipment are not manned, an automatic temperature recorder shall be installed, or alternatively temperatures shall be read at regular intervals and readings entered in a log book.
- Condensation shall be prevented.
- Rooms shall be kept clean and tidy.
- Refrigeration coils shall be defrosted regularly to prevent excessive build-up of ice and loss of efficiency. Defrosting shall be carried out without affecting the product.
- Temperature, relative humidity and airflow shall be maintained at a level suitable for the preservation of meat.

7.4.1.2.2 Storage procedures

- Carcasses, sides or quarters should be hung without touching each other, ceilings, walls or floors to permit adequate air circulation; cuts of unwrapped meat shall be hung or placed in suitable corrosion-resistant trays in a manner that permits adequate circulation of air around the meat. Drip of water from one piece of meat to another shall be avoided.
- Cartons of meat shall not be placed directly on the floor, or rest against walls or touch ceiling to ensure adequate circulation of air around them. If cartons contain warm meat, there shall be adequate airflow around each individual carton.
- Refrigerated, unwrapped meat shall not be stored at ambient temperature as condensation forming on the meat will accelerate microbial spoilage.
- A record shall be kept of all meat placed into or taken out of the refrigerated storage.

7.4.2 Transportation of meat

- Meat shall not be carried in any means of transport which is being used for conveying live animals or in the same means of transport used for carrying other goods which may have an adverse effect on the meat.
- Carcasses, parts of carcasses or edible offal shall not be carried in any means of transport that is not fully closed.
- Meat shall not be placed in any means of transport which has not been cleaned and sanitized before loading.
- Meat shall be protected against contamination and deterioration during loading and unloading means of transport.
- Carcasses, sides and quarters shall be hung during transport or suitably placed on racks or similar equipment.
- Heads and trotters shall only be transported when skinned or scalded and stomachs only when thoroughly cleaned or scalded.

7.4.3 Cutting and retail sale of meat

Where meat is cut, boned, handled or stored in establishments or offered for sale, in retail outlets, the following conditions shall be fulfilled:

- The premises shall be approved by the concerned controlling authority and shall meet the requirements for construction and layout as recommended in item 4 of this standard.
- Personnel engaged at establishments and retail outlets shall meet the provisions mentioned in 7.3.1 of this standard.
- The operating conditions set out in 7.3.2 of this standard shall be met. Meat shall be handled and stored in a manner that will protect it from contamination and deterioration.
- Only meat which has been examined by an inspector, branded and refrigerated as fit for human consumption, according to 7.3.4 of this standard, shall be stored, handled or offered for sale in any approved establishments or retail outlets.

7.4.4 Packaging

In case meat is packaged or wrapped, the following conditions shall apply:

- Packaging materials shall be stored and used in a clean and hygienic manner. It shall not be stored in rooms where exposed meat is being stored or handled.
- The wrapping shall be sufficient for the purpose of protecting the meat from contamination in the conditions under which it is to be handled, transported or stored.
- Only approved wrapping materials shall be used. They shall be non-toxic and shall not leave harmful deposits of any kind on the meat, or otherwise contaminate it.
- Cases or cartons used for packaging meat shall be new, have not been used previously and provided with an inner liner that complies with the above conditions for approved wrapping. An inner liner may not be required if pieces of meat are individually wrapped before packaging.

7.5 Controlling authority and management responsibility

7.5.1 Regulatory control

An official qualified veterinarian, appointed by the controlling authority, shall ensure that all conditions of this standard are being met. In particular, at least one official veterinarian shall be appointed for the supervision of hygiene, including meat inspection, of each abattoir and custom slaughterhouse. Establishments and retail outlets shall be periodically inspected by an official veterinarian.

7.5.2 Management responsibility

Implementation of the hygiene standards is the ultimate responsibility of the manager. However, each abattoir, custom slaughterhouse, establishment and retail outlet shall designate a single individual as a “Hygiene Officer” who is to be directly responsible to the manager.

- The maintenance of hygiene standards shall, nonetheless, be the duty of all production staff. The hygiene officer shall have the authority to halt production if operating conditions are not of the required standard.

The manager shall also ensure that:

- A defined programme schedule of cleaning and sanitation be established and maintained.
- This programme shall ensure that the site is kept clean and tidy and that processing areas and equipment are cleaned and sanitized appropriately to the required standard.
- Staff shall be well informed about the significance of contamination and the hazards it causes.
- Staff shall be well trained on cleaning methods and the use of cleaning equipment and chemicals.
- Staff shall be trained to dismantle processing equipment to allow adequate cleaning and sanitization.

7.5.3 Documentation and product traceability

In the event of product failure, documentation shall provide an effective means of tracing the source of the product.

- All facilities and services shall have both design and commissioning approval from the controlling authority. Any modification to such facilities or operating system shall be approved by the controlling authority.
- Verification that the approved operating conditions are maintained, shall be made available for inspection by the controlling authority.
- The controlling authority shall be assured that all staff involved in meat processing and transportation are trained and capable of fulfilling their designate functions.