
**Code of hygienic practice for processed
meat products**

ICS: 67.120.10

Descriptors: meat and meat products, definitions, facilities, hygiene packing, storage, transport

Foreword

This Ethiopian Standard has been prepared under the direction of Agricultural and Food Technology Technical Committee and published by the Quality and Standards Authority of Ethiopia (QSAE)

In the preparation this Ethiopian Standard references have been made to the following:

-Indian Standard code of hygienic conditions for processed meat products

-Codex Alimentarius Vol. C Recommended international code of hygienic practice for processed meat products
CAC/RCP 13-1981 Rev.1 (1985)

Acknowledgement is made for the use of information from the above publications.

Code of hygienic practice for processed meat products

1 Scope

This code of hygienic practice applies to processed meat products and contains the minimum requirements of hygiene in the production handling packing, storing and transportation of processed meat products to ensure a healthful and wholesome supply of meat products.

2 Normative references

The following Ethiopian Standard contains provisions, which, through reference in this text, constitute provisions of this Ethiopian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent editions of the standards. Registers of currently valid standards are maintained in the Quality and Standards Authority of Ethiopia.

ES 261:2001, drinking water specification

ES 577:2001, General principles of food hygiene

ES 1116:2005, Code of practice for Ante-Mortem and post-mortem Inspection of Slaughter Animals

3 Definitions

For the purpose of this Ethiopian Standard, the following definitions shall apply

3.1

abattoir

shall mean premises approved and registered by the controlling authority used for the slaughter of animals for human consumption

3.2

brand

shall mean any mark or stamp approved by the controlling authority and also includes any tag or label bearing such mark or stamp

3.3

cleaning

shall mean the removal of soil, food residues, dirt, grease or other objectionable matter

3.4

contamination

shall mean the direct or indirect transmission of objectionable matter

3.5

controlling authority

in relation to an establishment shall mean the official authority charged by the government with the control of hygiene including inspection of meat and meat products

3.6

detain

shall mean held under the control and security of the controlling authority pending final judgement

3.7
disinfection

shall mean the reduction, of number of micro organisms to a level that will not lead to harmful contamination of meat and meat products by applying hygienically satisfactory chemical agents and/or physical methods, without adversely affecting the food

3.8
edible

shall mean fit for human consumption

3.9
establishment

shall mean any premises approved and registered by the controlling authority in which meat products are prepared, processed, handled packaged or stored

3.10
hermetically sealed

containers mean containers which are designed and intended to protect the content against the entry of microorganisms during and after heat processing

3.11
ingredient

shall mean any substance including food additives used in the manufacture or preparation of a meat product

3.12
inspector

shall mean a properly trained officer appointed by the controlling authority of a country for the purpose of inspection of meat and meat products and supervision of meat hygiene

3.13
lot

shall mean a definite quantity of a commodity produced under essentially the same conditions

3.14
meat

shall mean the edible part of any animal slaughtered in an abattoir

3.15
meat product

shall mean a product intended for human consumption containing meat from animals

3.16
packaging material

shall mean containers such as cans, bottles, cartons, boxes, cases and sacks, or wrapping and covering material such as foil, film, polyethylene, metal, paper, wax-paper and cloth

3.17
potable water

shall mean water that is pure and wholesome in accordance with ES 261:2001_requirements contained in the Drinking Water Quality"

3.18
processed

includes all methods of manufacture and preservation but does not include pre-packaged fresh, chilled or frozen meat

3.19
protective clothing

shall mean special garments intended to prevent the contamination of meat and/or meat products and used as outer-wear by persons in an establishment and includes head coverings, face masks, footwear and gloves

3.20**unfit for human consumption,**

in relation to meat and meat products, shall mean parts that would normally be edible but is inedible because of disease, decomposition or any other reason.

4 Ingredient requirements

4.1 All meat used in the manufacture of meat products shall have been produced in compliance with the provisions of the ES 1115 Code of Hygienic Practice for Fresh Meat and shall have been subjected to the inspection processes prescribed in ES 111 Code of practice for Ante-Mortem and post-mortem Inspection of Slaughter Animals. An inspector as fit for human consumption shall have passed it.

4.2 No meat or other ingredient which has undergone deterioration or any process of decomposition or which has been contaminated with foreign matter to an extent which has made it unfit for human consumption shall be used for the processing and manufacture of meat products.

4.3 All ingredients shall be adequately stored and kept off the floor of after delivery to the establishment.

4.4 Where necessary, laboratory tests *shall* be made of the ingredients prior to their being moved into the production area of the establishment.

5 Establishment: registration, design and facilities

5.1 Registration Establishments shall be approved and registered by the controlling authority.

5.2 Location Establishments shall be located in areas not subject to regular and frequent flooding and free from objectionable odours, smoke, dust and other contaminants.

5.3 Roadways and Areas Used by Wheeled Traffic Such roadways and areas serving the establishment which are within its boundaries or in its immediate vicinity shall have a hard paved surface suitable for wheeled traffic. There shall be adequate drainage and provision shall be made to allow for cleaning.

Where appropriate, establishments shall be so designed that access can be controlled.

5.4 Buildings and facilities

5.4.1 Establishments shall provide adequate working space for the satisfactory performance of all operations.

5.4.2 The construction shall be sound and ensure adequate ventilation, good natural or artificial lighting and easy cleaning, all construction materials shall be such that they do not transmit any undesirable substances to the meat or meat products.

5.4.3 The establishment shall be laid out and equipped so as to facilitate proper supervision of meat hygiene including performance of inspection and control.

5.4.4 The establishment shall be of such construction as to protect against the entrance and harbouring of insects, birds, rodents or other vermin, as well as the entry of environmental contaminants such as smoke, dust, etc.

5.4.5 Buildings and facilities shall be designed to provide separation, by partition, location or other effective means, between those operations which may cause cross-contamination

5.4.6 Establishments shall be laid out and equipped so as to ensure, that meat and meat products do not come into contact with floors, walls or other fixed structure, except those which are specifically designed for contact with meat.

5.4.7 The construction and layout of any chilling room, freezing room, freezer store or freezer shall satisfy the requirements of this Code.

5.4.8 In rooms where work on meat and meat products is undertaken:

5.4.8.1 Floors shall be of water-proof, non-absorbent, washable and non-slip materials, without crevices, and shall be easy to clean and disinfect. Where appropriate, floors shall slope sufficiently for liquids to drain to trapped outlets including grates.

5.4.8.2 Walls shall be of water-proof, non-absorbent and washable materials and shall be light-coloured. Up to a height appropriate for the operation they shall be smooth and without crevices, and shall be easy to clean and disinfect. Where appropriate, angles between walls and floors shall be sealed and coved, and angles between walls and walls, and ceilings and walls, shall be sealed to facilitate cleaning.

5.4.8.3 Ceilings shall be so designed, constructed and finished as to prevent the accumulation of dirt and minimize condensation, mould development and flaking, and shall be easy to clean.

5.4.8.4 Windows and other openings shall be so constructed as to avoid accumulation of dirt and those which open shall be fitted with insect-proof screens. Screens shall be easily movable for cleaning and kept in good repair. Internal windowsills, if present, shall be sloped to prevent use as shelves.

5.4.8.5 Doors shall have smooth, non-absorbent surfaces and, where appropriate, be self-closing and close fitting.

5.4.8.6 Stairs lift cages and auxiliary structures such as platforms, ladders and chutes, shall be so situated and constructed as not to cause contamination to meat. They shall be capable of being effectively cleaned. Chutes shall be constructed with inspection and cleaning hatches.

5.4.8.7 The use of construction materials which cannot be adequately cleaned and disinfected, such as wood, shall be avoided unless its use would clearly not be a source of contamination.

5.4.8.8 Office accommodation shall be provided for the use of the inspection service.

5.5 Sanitary facilities

5.5.1 Water supply

5.5.1.1 An ample supply of potable water conforming to ES 261:2001, drinking water specification under adequate pressure shall be available with adequate facilities for its storage, where necessary, and distribution, and with adequate protection against contamination.

5.5.1.2 An adequate supply of hot potable water shall be available at all times during working hours. . *For* disinfection purposes hot water at e.g. 82°C for no less than two minutes could be used and dispensed in such a way (e.g. in specially designed boxes near the working area) that blades of knives etc. can be submerged in the water for an adequate contact time (no less than two minutes). Often this water supply is separate from other hot water supplies used for cleaning, hand-washing etc. But if there is only one hot water supply the term "adequate" shall mean that even at times where large amounts of hot water is used (e.g. during cleaning operations) the water supply from any tap in the establishment shall not be decreased.

5.5.1.3 Ice shall be made from potable water and shall be manufactured handled and stored so as to protect it from contamination.

5.5.1.4 Steam used in contact directly with meat and meat products shall be produced from potable water and contain no substances which may be hazardous to health or may contaminate the food.

5.5.1.5 Non-Potable *Water* used for steam production, cooling of refrigeration equipment, fire control and other similar purposes not connected with meat and meat products shall be carried in completely separate lines, identifiable preferably by color and with no cross-connection with or back siphonage into the system carrying potable water.

5.5.2 Effluent and waste disposal

5.5.2.1 Establishments shall have an efficient effluent and waste disposal system. All effluent lines (including sewer systems) shall be large enough to carry peak loads and shall be constructed in such a manner as to avoid contamination of potable water supplies and the environment

5.5.3 Facilities for storage of waste and inedible material

5.5.3.1 Facilities shall be provided for the storage of waste and inedible material prior to removal from the establishment. These facilities shall be designed to prevent access to waste or inedible material by pests and to avoid contamination of food, potable water, equipment or buildings on the premises.

5.5.4 Changing facilities and toilets

5.5.4.1 Adequate, suitable, and conveniently located changing facilities and toilets shall be provided in all establishments. Toilets shall be so designed as to ensure hygienic removal of waste matter. These areas shall be well lit, ventilated and where appropriate heated and shall not open directly on to food handling areas. Hand washing facilities with warm or hot and cold water, a suitable hand-cleaning preparation, and with suitable hygienic means of drying hands, shall be provided adjacent to toilets and in such a position that the employee must pass them when returning to the processing area. Where hot and cold water are available mixing taps shall be provided. Where paper towels are used, a sufficient number of dispensers with paper towels and receptacles for used towels shall be provided adjacent to each washing facility. Taps of a non-hand operable type are preferable. Notices shall be posted directing personnel to wash their hands after using the toilet.

5.5.5 Hand washing facilities in processing areas

5.5.5.1 Adequate and conveniently located facilities for hand washing and drying shall be provided wherever the process demands. Where appropriate, facilities for hand disinfection shall also be provided. Hand washing facilities shall be equipped as under 5.5.4. The facilities shall be furnished with properly trapped water pipes leading to drains

5.5.6 Cleaning and disinfection facilities

5.5.6.1 All rooms used for de-boning, preparing, packaging or other handling of meat and meat products shall be equipped with adequate facilities for cleaning and disinfecting implements, conveniently located for the use of personnel during operations. These facilities are for use exclusively in the cleaning and disinfection of knives, steels, cleavers, saws and other implements.

5.5.6.2 All facilities for cleaning and disinfecting implements shall be of such nature and size as to permit proper cleaning and disinfection of implements. These facilities shall be constructed of corrosion-resistant materials and shall be capable of being easily cleaned.

5.5.6.3 All facilities for cleaning and disinfecting of implements shall be fitted with suitable means of supplying hot water in sufficient quantity at all times while meat or meat products are being handled in that part of the establishment.

5.5.7 Lighting

5.5.7.1 Adequate natural or artificial lighting shall be provided throughout the establishment. Where appropriate, natural light shall be augmented by artificial light and the lighting shall not alter colour

5.5.7.2 Light bulbs and fixtures suspended over meat in any stage of production shall be of a safety type and protected to prevent contamination of meat and meat products in case of breakage.

5.5.8 Ventilation

5.5.8.1 Adequate ventilation shall be provided to prevent excessive heat, steam condensation and dust and to remove contaminated air. The direction of the airflow shall never be from a dirty area to a clean area. Ventilation openings shall be provided with an insect screen or other protective enclosure of non-corrodible material. Screens shall be easily removable for cleaning.

5.5.9 Equipment and utensils

5.5.9.1 All equipment and utensils used in meat handling areas and which may contact exposed meat and meat products shall be made of material which does not transmit toxic substances, odour or taste, is non-absorbent, is

resistant to corrosion and is capable of withstanding repeated cleaning and disinfection. Surfaces shall be smooth and free from pits and crevices. The use of wood and other materials which cannot be adequately cleaned and disinfected shall be avoided except when their use would clearly not be a source of contamination. The use of different materials in such a way that contact corrosion can occur shall be avoided.

5.5.10 Sanitary design, construction and Installation

5.5.10.1 All equipment and utensils shall be so designed and constructed as to prevent hygienic hazards and permit easy and thorough cleaning and disinfection and, where practicable, be visible for inspection. Stationary equipment shall be installed in such a manner as to permit easy access and thorough cleaning.

5.5.10.2 Containers for inedible material and waste shall be leak-proof, constructed of non-corrosive metal or other suitable impervious material which shall be easy to clean or disposable and, where appropriate, able to be closed securely.

5.5.10.3 All refrigerated spaces shall be equipped with temperature measurement or recording devices.

5.5.11 Equipment Identification

5.5.11.1 Equipment and utensils used for inedible materials or waste shall be so identified and shall not be used for edible products.

6 Establishment: hygiene requirements

6.1 Maintenance

6.1.1 The buildings, rooms, equipment and all other physical facilities of the establishment, including drains, shall be maintained in good repair and in orderly condition. Except for rooms where heat processing or cleaning operations are performed they shall be free from steam, vapour and surplus water.

6.2 Cleaning and disinfection

6.2.1 Cleaning and disinfection shall meet the requirement of this Code. For further information on cleaning and disinfection procedures, see ES 577:2001 General Principles of Food Hygiene. Working rooms shall be kept clean.

6.2.2 Amenities provided for the use of employees and the inspection service including changing facilities, toilets and the inspection office space shall be kept clean at all times.

6.2.3 If rooms intended and most of the time used for the handling, preparation, processing, packaging or storage of meat and meat products are used for any other food preparation purposes, then cleaning and disinfection are necessary immediately before and after such use.

6.3 Hygiene control programme

6.3.1 It is desirable that each establishment in its own interest designate a single individual, whose duties divorced from production, to be held responsible for the cleanliness of the establishment. His staff shall be a permanent part of the organization or employed by the organization and shall be well trained in the use of special cleaning tools, methods of dismantling equipment for cleaning and in the significance of contamination and the hazards involved. A permanent cleaning and disinfection schedule shall be drawn up to ensure that all parts of the establishments are cleaned appropriately and that critical areas, equipment and material are designated for cleaning and/or disinfection daily or more frequently if required.

6.4 Storage and disposal of waste

6.4.1 Waste material shall be handled in such a manner as to exclude contamination of food or potable water. Precautions shall be taken to prevent access to waste by pests. Waste shall be removed from the meat and meat products handling and other working areas at intervals and at least daily. Immediately after disposal of the waste, receptacles used for storage and any equipment which has come into contact with the waste shall be cleaned and disinfected. Waste storage containers shall be cleaned and disinfected at least daily.

6.5 Exclusion of domestic animals

6.5.1 Animals that are uncontrolled or that could be a hazard to health shall be excluded from establishments.

6.6 Pest control

6.6.1 There shall be an effective and continuous programme for the control of insects, birds, rodents or other vermin. Establishments and surrounding areas shall be regularly examined for evidence of infestation. Should pests gain entrance to the establishment or surrounding areas, eradication measures shall be instituted. Control measures involving treatment with chemical, physical or biological agents shall only be undertaken by or under direct supervision of personnel who have a thorough understanding of the potential hazards to health resulting from the use of these agents, including those, which may arise from residues retained in the product. Such measures shall only be carried out in accordance with the recommendations of the official agency having jurisdiction and with the full knowledge of the inspector.

6.6.2 Pesticides shall only be employed if other precautionary methods cannot be used effectively. Only pesticides approved for use in an establishment by the competent authority shall be used and the greatest care shall be exercised to prevent any contamination of the meat or meat products, equipment or utensils. Before pesticides are applied all meat and meat products shall be removed from the room and all equipment and utensils shall be thoroughly washed prior to being used again.

7 Handling and storage of hazardous substances

7.1 Pesticides or other substances which may represent a hazard to health shall be labelled with a warning about their toxicity and use. Except as required for purposes of hygiene such substances which may contaminate meat and meat products, packaging materials and ingredients shall be handled and stored in a part of the establishment which is not used for the preparation, processing, handling, packaging or storage of meat and meat products. They shall be handled and dispensed only by authorized and properly trained personnel or by persons under strict supervision of trained personnel. Extreme care shall be taken to avoid contamination of meat and meat products. However, materials employed in the construction and maintenance of an establishment may be used at any time with the approval of an inspector.

7.2 Many substances used for the purposes of pest control, disinfection, painting, etc. may contain substances harmful to man, and if they contaminate meat products they may present a public health hazard. The inspector shall learn the potential danger of such substances to human, the storage of them and their use. He shall discourage the use of such substances during operation, and satisfy himself that they - when used - do not leave any residues on meat and meat products or on surfaces or utensils that meat and meat products may contact.

8 Personal effects and clothing

8.1 Personal effects and clothing shall not be kept in food handling areas.

8.2 Maintenance tools

8.2.1 Cleaning and maintenance tools and products shall not be stored in a food handling area.

9 Personnel hygiene and health requirements

9.1 Hygiene training

9.1.1 Managers of establishments shall arrange for adequate and continuing training of every handler of meat and meat products in hygienic handling of meat and meat products and in personal hygiene so that they understand the necessary precautions to prevent contamination. Instructions shall include relevant parts of this Code. For this purpose material elaborated by the controlling authority or the establishment in cooperation with the inspector shall be used.

9.2 Medical examination

9.2.1 Persons who come into contact with meat and meat products in the course of their work shall have a medical examination prior to their employment if the official agency having jurisdiction, acting on medical advice, considers that this is necessary, whether because of epidemiological considerations, the nature of the meat product prepared in a particular establishment or the medical history of the prospective meat or meat product handler. Medical

examination of meat or a meat product handler shall be carried out at other times when clinically or epidemiological indicated.

9.2.2 The manager of any establishment shall, if required to do so by an inspector, produce for perusal by the inspector any medical certificate produced to the manager by an employee of the establishment.

9.3 Communicable diseases

9.3.1 The management shall take care to insure that no person, while known or suspected to be suffering from, or to be a carrier of a disease likely to be transmitted through meat and meat products or while afflicted with infected wounds, skin infections, sores or with diarrhoea, is permitted to work in any area in any capacity in which there is any likelihood of such a person directly or indirectly contaminating meat or meat products with pathogenic microorganisms. Any person so affected shall immediately report to the management that he is ill.

9.3.2 Persons with infected wounds or skin infections may contaminate meat and meat products (even such in cans immediately after retorting) with Staphylococci. Persons with diarrhoea and even symptom less carriers of microorganisms causing gastroenteritis may contaminate meat and meat products with Salmonellae or other gastrointestinal pathogens. Such persons shall not be allowed to handle meat and meat products even in closed containers, until the responsible medical authority has declared that they do not create a hazard to health.

9.4 Injuries

9.4.1 Any person who has a cut or a wound shall discontinue working with meat and meat products and until he is suitably bandaged shall not engage in the preparation, handling, packaging or transportation of meat and meat products. No person working in any establishment shall wear exposed bandage unless the bandage is completely protected by a waterproof covering which is conspicuous in colour and is of such a nature that it cannot become accidentally detached. Adequate first-aid facilities shall be provided for this purpose.

9.4.2 If unprotected, wounds become easily infected with pathogenic microorganisms like staphylococci. These may then subsequently contaminate meat and meat products. To prevent infection and contamination wounds shall immediately be dressed with e.g. detectable bandage. Workers shall be encouraged to report such accidents to the management.

9.5 Washing of hands

9.5.1 Every person engaged in a meat and meat products handling area shall wash his hands frequently and thoroughly with a suitable hand cleaning preparation under running warm potable water while on duty. Hands shall always be washed before commencing work, immediately after using the toilet, after handling contaminated material, and whenever else necessary. After handling diseased or suspect materials hands shall be washed and disinfected immediately. Notices requiring hand-washing shall be displayed.

9.5.2 It shall be the responsibility of management to arrange for easy access to hand-washing facilities - outside toilets, near the working area, etc. Also management shall motivate and *instruct the* employees in proper hand-washing. There shall be adequate supervision to ensure compliance with this requirement.

9.6 Personal cleanliness

9.6.1 Every person engaged in an area in an establishment where meat and products are handled shall maintain a high degree of personal cleanliness while on duty, and shall at all times while so engaged wear protective clothing including head covering and footwear, all of which shall be washable unless designed to be disposed of and which shall be maintained in a clean condition consistent with the nature of work in which the person is engaged.

9.6.2 in the establishment clothing may easily become, contaminated with meat scraps, fat and blood. Besides being anaesthetic such contamination may give rise to microbial proliferation, which may affect adversely meat and meat products. At the end of a shift all protective clothing shall be thoroughly washed and dried. Aprons and similar items shall not be washed on the floor. Such items shall not be left on equipment in the working area.

9.6.3 Such items shall preferably be deposited in locked safes, protected against vermin. Under no circumstances shall they be left on implements in the working area.

9.7 Personal behaviour

9.7.1 Any behaviour which can potentially contaminate the meat and meat products, such as eating, use of tobacco, chewing, spitting, shall be prohibited in any part of an establishment used for the preparation, packaging storing or transportation of meat and meat products.

9.8 Gloves

9.8.1 Gloves if used in the handling of meat and meat products shall be maintained in a sound and clean condition. The wearing of gloves does not exempt the operator from having thoroughly washed hands. Gloves shall be made of an impermeable material except where their usage would be inappropriate or incompatible with the work involved.

9.8.2 Disposable gloves are to be preferred - to be changed as often as the work involved requires or at least after every break. Special care shall be given to metal gloves. Such gloves shall be cleaned and disinfected at least once a day and also whenever they become contaminated. Metal gloves with worn or missing links shall be promptly repaired or replaced

9.9 Visitors

9.9.1 Every person who visits an area in an establishment where meat and meat products are handled shall wear clean protective clothing.

9.10 Supervision

9.10.1 Responsibility for ensuring compliance by all personnel with all requirements of paragraphs 9 to 9.10.1 inclusive shall be specifically allocated to competent supervisory personnel

10 Establishment: hygienic processing requirements

10.1 Raw material requirements

10.1.1 All meat used in the manufacture of meat products shall have been produced in compliance with the provisions of ES 1116:2005 Code of processes of hygienic practice for Fresh Meat and shall have been subjected to the inspection process prescribed in ES 1116 Code of Ante-Mortem and Post-Mortem Inspection of Slaughter animals and for Ante-Mortem and Post-Mortem Judgement of Slaughter Animals and Meat. It shall have been passed by an inspector as fit for human consumption.

10.1.2 All other raw materials and ingredients - whether of animal, vegetable or other origin - shall be fit for human consumption, and - if applicable - shall have been produced in compliance with the general Code of food Hygiene ES 577:2003.

10.1.3: The provisions in 10.1.1 to 10.1.5 shall ensure that a competent authority has inspected the origin *and* production of the meat, to be used for the production of meat products. If he has found that the raw material is fit for human consumption, he will mark it accordingly and may issue a certificate that shall follow the consignment of the meat, poultry meat or game meat. The inspector or the manager in the establishment producing meat products shall convince himself of the acceptability of the raw material by inspecting the marking, the accompanying certificate, *if* any, and the raw material itself.

10.1.4 No meat, or other ingredient which has undergone deterioration or any other process of decomposition or which has been contaminated with foreign matter, making it unfit for human consumption shall be used for the processing and manufacture of meat products. Where necessary, laboratory tests shall be made of the ingredients prior to their being moved into the production area of the establishment.

10.1.5 Although passed for human consumption by an inspector, the meat may have undergone such changes, e.g. during transportation, that in the establishment producing products it is found no longer fit for human consumption. Such meat may be used for other purposes than human consumption or be destroyed. In cases

where only superficial contamination has taken place, trimming of the contaminated part may suffice. The decision whether or not the meat is still fit for human consumption may be guided by microbiological, chemical or physical analysis relative to the changes observed or suspected.

10.1.6 Raw materials and ingredients stored on the premises of the establishment shall be maintained under conditions that will prevent spoilage protect against contamination and minimize damage. Stocks of raw materials and ingredients shall be properly rotated.

10.2 Prevention of cross-contamination

10.2.1 Effective measures shall be taken to prevent contamination of meat or meat products by direct or indirect contact with material at an earlier stage of the process. Every department in which meat products are prepared, processed or stored shall be used at that time only for that purpose or for the preparation and storage of other edible products subject to the same conditions of hygiene. If the departments are used for processing of non-meat products, the arrangements shall be such that it can be ensured that there is no resultant contamination of the meat product.

10.2.2 Any persons handling raw materials or semi-processed meat products capable of contaminating the end product shall not come into contact with any finished products unless and until they have cleaned and disinfected all utensils used by them and have changed all protective clothing worn by them during the handling of raw materials and semi-processed products which have come into contact with or have been soiled by the raw materials or semi-processed products. Hands and arms shall always be washed thoroughly and disinfected after handling raw materials and semi-processed products prior to handling finished products.

10.2.3: In most cases finished products have been subjected to a process that will reduce its microbial count, but e.g. after heat processing there could be a possibility for micro organisms contaminating the meat products. In this case micro organisms contaminating the meat product after heat processing will lack the competition from the meat's "natural" flora and may proliferate quickly. Such contamination may be derived from utensils and from hands, arms or clothing of personnel that have been working with raw materials or semi-processed meat products. For that reason it is important that they take any precautions for preventing the contamination of the finished, especially un-packaged product. In certain cases, e.g. after handling of a finished product as sausages with mould growth, workers shall preferably not handle raw materials or semi-processed meats.

10.2.4 Equipment such as trays, vats, tables, etc. shall not be used interchangeably for raw products and processed products unless it is completely cleaned and disinfected before moving to the area designated for processed meat products. Exposed ready-to-eat or cooked products shall not be stored in the same room with raw meat.

10.2.5 The operation of de-boning and trimming shall always be carried out as rapidly as possible and meat shall not be allowed to accumulate in rooms used for de-boning and trimming.

10.2.6 De-boning and trimming involve exposure of meat surfaces to contamination - from other meat and from equipment and utensils. Such contamination could be kept to a minimum by prompt removal of de-boned or trimmed meat - either to a cold store or to further processing. Any cooking or smoking of meat products shall be done in separate areas equipped for this purpose.

10.3 Use of water

10.3.1 Only potable water conforming to ES 261:2001 shall be used in meat processing. On-potable water may be used with the acceptance of the official agency having jurisdiction for steam production, refrigeration, fire control and other similar purposes not connected with food. However, non-potable water may, with specific acceptance by the official agency having jurisdiction be used in certain food handling areas provided this does not constitute a hazard to health.

10.3.2 Water re-circulated for re-use within an establishment shall be treated and maintained in a condition so that no health hazard can result from its use. The treatment process shall be kept under constant surveillance. Alternatively re-circulated water, which has received no further treatment, may be used in conditions where its use would not constitute a health hazard and will not contaminate either the raw material or the end-product. Non-potable re-circulated water shall have a separate distribution system, which can be readily identified. The

acceptance of the official agency having jurisdiction shall be required for any treatment process and for the use of re-circulated water in any food process.

10.4 Processing

10.4.1 Technically competent personnel shall supervise processing. All steps in the production process, including packaging, shall be performed without unnecessary delay and under conditions which will prevent the possibility of contamination, deterioration, or the development of pathogenic and spoilage micro organisms.

10.4.2 Ideally a production process shall be so designed that all steps are performed immediately after each other - in a continuous flow. If, however, for some reason delays are necessary, semi-manufactured products shall during the delay be chilled to and held at temperatures below 10°C. Processing of meat often shall mean a change of the state of the meat product so that it will be more susceptible to microbial attack. Exceptions are e.g. controlled drying and curing, processes that will reduce the potential for microbial growth. Otherwise time and temperature, under certain circumstances water activity, oxidation-reduction potential or the microbiology of the meat product shall be regularly monitored.

10.4.3 Methods of preservation and necessary controls shall be such as to protect against contamination or development of a public health hazard and against deterioration within the limits of good commercial practice.

10.5 Packaging

10.5.1 No containers, equipment or utensils shall be stored in any *part of an* establishment in which exposed meat or meat products are prepared, processed, handled, packaged or stored. All packaging material shall be stored in a clean and hygienic manner. The material shall be appropriate for the meat product to be packaged and for the expected conditions of storage and shall not transmit to the product objectionable substances beyond the limits acceptable to the official agency having jurisdiction. The packaging material shall be sound and shall provide appropriate protection from contamination.

10.5.2 Meat product containers shall not have been used for any purpose, which may lead to contamination of the product. If necessary according to their origin containers shall be inspected immediately before use to ensure that they are in a satisfactory condition and are cleaned or cleaned and disinfected; when washed they shall be well drained before filling. Only packaging material required for immediate use shall be kept in the packaging or filling area.

10.5.3 Packaging material such as paperboard for cartons shall not be assembled in rooms where exposed meat or meat products are prepared, processed, handled, packaged or stored, unless it is part of a hygienically performed automated operation.

10.5.4 Rough treatment of the containers shall be avoided to prevent the possibility of contamination of the finished meat product. Meat products shall be packaged in a manner, which will protect them from contamination and deterioration under normal condition of handling, transportation and storage.

10.6. Lot Identification

10.6.1 Packaged meat products shall bear a permanent marking code or in clear to identify the producing factory and the lot.

10.7 Processing and production records

10.7.1 Permanent legible and dated records of pertinent processing and production details shall be kept concerning each lot. These records shall be retained for a period that exceeds the shelf life of the product, but unless a specific need exists they need not be kept for more than two years. Records shall also be kept of the initial distribution by lot.

10.8 Storage

10.8.1 Meat and meat products shall be stored under such conditions as will preclude the contamination with and/or proliferation of microorganisms and protect against deterioration of the product or damage to the container. During storage, periodic inspection of the meat and meat products shall take place to ensure that only meat

products, which are fit for human consumption, are dispatched and those end product specifications shall be complied with when they exist. The product shall be dispatched in the sequence of the lot numbers.

10.8.2 Entry shall be restricted to personnel necessary to carry out operations efficiently. Doors shall not be left open for extended periods and shall be closed immediately after use. Meat or meat products as well as containers holding meat or meat products shall not be stacked directly on the floor.

10.8.3 Warm products shall be chilled before packaging into large containers to prevent deterioration of the central part of the product. Rapid cooling down of all parts or all packages of meat products and maintaining non-shelf-stable meat products at chill temperature are essential. They shall be placed on pallets or on dunnage in such a way that there is adequate air circulation.

10.8.4 No chilling room shall be loaded beyond its designed capacity. Where refrigeration equipment is not manned, automatic temperature recorders shall be installed. If no automatic device is installed, temperatures shall be read at regular intervals and the readings recorded in a log book.

10.8.5 Maintenance of the desired temperature in chilling rooms is extremely important. Accidentally the cooling equipment may fail with consequent temperature rise in the room and in the products. To detect such temperature failures, records - automatic or manual - shall be taken and the results reported. to the manager who will, if necessary, inform the inspector for him to decide what action to be taken.

10.9 Transport of the end product

10.9.1 Means of transport of containers shall comply with the following conditions:

10.9.1.1 All internal finishes shall be made of corrosion-resistant material, be smooth, impervious and easy to clean and disinfect. Joints and doors shall be sealed so as to prevent the entry of pests and other sources of contamination.

10.9.1.2 The design and equipment shall be such that the required temperature can be maintained throughout the whole period of transport. Where transportation is under refrigeration it is desirable to install temperature recorders. If no automatic device is installed, temperature shall be read at regular intervals and the reading recorded in a logbook.

10.9.1.3 Vehicles intended for the transport of meat products shall be equipped in such a manner that the meat products do not come into contact with the floor. Meat products shall not be carried in any shall mean of transport which is used for conveying live animals.

10.9.1.4 Meat products shall not be carried in the same means of transport as other goods in a way, which may adversely affect the meat products.

10.9.1.5 Meat products shall not be placed in any means of transport which are not clean. If necessary it shall be cleaned and disinfected before loading.

10.9.1.6 Every effort shall be made to prevent changes in temperature of frozen meat products at any time during storage and transport but where accidental thawing takes place, the meat products shall be examined and evaluated by the inspector before any further step is taken.

10.10 Sampling and laboratory control procedure

10.10.1 In addition to the routine control carried out by the inspection services, it is desirable that each establishment shall have access to laboratory control of the meat products processed. The amount and type of such control will vary with the type of meat product as well as the needs of management. Such control shall reject all meat products that are unfit for human consumption.

10.10.2 Laboratory facilities shall be available for the purpose of monitoring hygiene. This could be the establishment's own laboratory or an official laboratory or any other appropriate laboratory.

10.10.3 The inspector shall have access to all information relevant to his duties and responsibilities.

Samples of the production shall be taken to assess the safety and hygiene of the meat product.

10.10.4 Laboratory procedures used shall preferably follow recognized or standard methods in order that the results may be readily interpreted.

10.10.5 Laboratories checking for pathogenic microorganisms shall be well separated from meat production area.

11 End product criteria

11.1 Criteria such as microbiological, chemical or physical may be required depending on the nature of the meat product. However, application of the hazard analysis critical control point concept shall be more effective than intensive end product testing in ensuring that the requirements of this Code are followed and its purpose achieved. If end product testing is carried out, criteria shall include sampling procedures, analytical methodology, specifications and limits for acceptance.

11.2 To the extent possible in good manufacturing practice the products shall be free of objectionable matters.

11.3 When tested by appropriate methods of sampling and examination, the products:

11.3.1. Shall be free from pathogenic micro organisms in numbers representing a hazard to health.

11.3.2. Shall not contain any substances originating from micro organisms in amounts which may represent a hazard to health; and

11.3.3 Shall not contain any other poisonous or deleterious substances in amounts which may represent a hazard to health.

12. Preservation of meat products in hermetically sealed rigid containers

12.1 The products packed in hermetically sealed rigid metal containers shall be processed so that they present no public health hazard and withstand spoilage during subsequent storage, transport and sale. The temperature and duration of processing of specific formulations of canned meats shall be based on the recommendations of technical specialists competent in canning technology.

12.2 Processing shall be supervised in the establishment by technically competent personnel and be subject to check by the inspector. Seam measurements shall be made regularly during production and these, with processing records adequate to identify the processing and history of each batch of product, shall be kept by the management and made available to the inspector.

12.3 No water, other than potable water, shall be used for washing of empty containers or for the cooking or cooling of any hermetically sealed container. Where heat processed containers are cooled in water; any recirculated water shall be filtered and treated by the addition of chlorine. Such water, depending upon the potential degree of non-portability, shall contain from one to two parts per million of residual chlorine at the discharge end of the cooler. Any other *acceptable disinfectant may be used in effective concentration in place of chlorine.

12.4 Rough treatment of containers both before and after processing shall be avoided to prevent the possibility of contamination of the processed product. If it is essential to handle wet cans, personnel shall do so exercising hygienic precautions. Belts, runways, and other can conveying equipment shall be maintained in a clean condition and good repair. '

12.5 Processed hermetically sealed containers shall be inspected and any visibly defective container rejected.

12.6 Adequate facilities shall be provided for the incubation of random samples of individual batches of containers and, after establishment of a satisfactory history for the product involved, batches may be released provided the controlling inspection authority is assured that the product will be returned, if required.

12.7 Every container shall be permanently marked, in code or otherwise, to identify the establishment, country and date of production.

13 Preservation of meat products heat treated prior to packaging

13.1 In establishments in which meat products are heat treated prior to packaging a chill room shall be available for holding raw unprocessed meat on its reception and for storing boned, cut or otherwise prepared raw unprocessed meat which is not transferred directly to the sections in which it is cooked or otherwise processed.

13.2 These meat products shall be heat treated, handled subsequent to heat treatment and packaged in such a way that contamination is kept to a minimum so that they present no public health hazard and will withstand spoilage under the conditions of handling, storage, transport and sale indicated on the label. Particular care must be taken to prevent cross-contamination from raw unprocessed meat, preferably by physical separation of processing areas where exposed processed heat-treated meat products are handled.

13.3 The temperature and duration of the cooking. Process for these heat treated meat products shall be such that the heat treatment alone or in combination with other preserving processes protects public health.

13.4 On arrival in the cooking section the prepared products shall be placed in the cookers without delay. Cooking processes shall be supervised by technically competent personnel and be subject to check by the Controlling Inspection Authority. Cooking operations shall be controlled and also monitored by suitable and accurate recording devices. Processing records adequate to identify the processing and history of each batch of products shall be kept by the management and made available to the Controlling Inspection Authority.

13.5 There shall be adequate means for rapidly chilling in a hygienic manner any cooked meat product to an internal temperature of not more than 7 °C (45 °F). Water used for cooling any cooked meat product shall be of potable quality and may be re-circulated if treated and returned to potable quality.

13.6 At all stages following cooking manual handling of exposed meat products shall be kept to an absolute minimum and, if at all possible shall be replaced by mechanical methods.

13.7 Packaging of meat products preserved by heat treatment shall be carried out without undue delay in a separate room. However, packaging may be carried out in the same room provided precautions acceptable to the Controlling Authority are taken to prevent contamination of the product. Where primary packaging follows slicing and cutting these operations shall preferably take place in the same room under satisfactory conditions of hygiene. Packaged finished meat. Products shall be inspected to ensure the detection and rejection of visibly defective packages.

13.8 Meat products heat treated prior to packaging which require refrigeration shall be stored in chilled accommodation and protected from contamination.

13.9 Adequate laboratory facilities shall be available for the purpose of making regular bacteriological examinations of meat products. Regular bacteriological checks shall be made for all food contact surfaces to ensure that cleansing and disinfecting procedures are satisfactory.

13.10 Each container of the meat product shall be permanently marked, in code or in clear, to identify the producing factory and the lot.