

**SASO 44  
(GS 996)**

**BEEF, BUFFALO, MUTTON AND  
GOAT FRESH MEAT**

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ICS:

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## BEEF, BUFFALO, MUTTON AND GOAT FRESH MEAT

### 1- SCOPE AND FIELD OF APPLICATION

This standard is concerned with beef, buffalo, sheep and goat fresh meat.

### 2- COMPLEMENTARY REFERENCES

- 2.1 GS 9/1995 "Labelling of Prepackaged Foods".
- 2.2 GS 20/1984 "Methods for the Determination of Contaminating Metallic Elements in Foodstuffs".
- 2.3 GS 21/1984 "Hygienic Regulation for Food Plants and Their Personnels".
- 2.4 GS 592/1995 "Methods of Sampling, Meat and Meat Products".
- 2.5 GS 593/1995 "Physical Tests for Meat and Meat Products".
- 2.6 GS 150/1993 "Expiration Periods of Food Products – Part 1".
- 2.7 Draft Gulf standard to be approved by the Organization concerning Limits of Radiation Levels Permitted in Foodstuffs.
- 2.8 Draft Gulf standard to be approved by the Organization concerning The Methods of Detection of Limits of Radiation Levels Permitted in Foodstuffs.
- 2.9 GS .../1996 "Methods of Microbiological Examination for Meat, Fish, Shell-Fish and Their Products".
- 2.10 Draft Gulf Standard to be approved by the Organization concerning:
- 2.11 GS .../.... "Slaughtering requirements according to the Islamic Rules".
- 2.12 GS .../.... "Code of Hygienic Practice Preparation Transportation, Handling and Storing of Fresh Meat".
- 2.13 GS .../.... "Ante-Mortem and Post-Mortem Inspection of Slaughter Animals".
- 2.14 GS .../.... "Maximum Limits for Pesticide Residues in Food Products and Their Methods of Determination".
- 2.15 GS .../.... "Maximum Permissible Levels of Veterinary Drug Residues in Food Products of Animal Origin".
- 2.16 GS .../.... "Determination of Hormones and Antibiotics Residues in Meat and Meat Products".
- 2.17 GS .../.... "Methods of Detection of Pork and Lard in Food Products".

**3- DEFINITIONS**

- 3.1 Abattoir  
Is a premises approved and registered by the authorities used for the slaughtering of animals for human consumption.
- 3.2 Slaughter animals  
Any mammal approved by the authorities for slaughtering the authorities. It includes bovine, buffalo, ovine and carbine.
- 3.3 Carcase  
The body of any slaughtered animal slaughtered according to Islamic rules, after bleeding and dressing in the abattoir.
- 3.4 Dressing  
The removal of the hide or skin, viscera (including or not including heart, liver or kidney), genital organs urinary bladder, feet up to the carpal and tarsal joints and udders of lactating animals that have given birth or that are in advanced state of pregnancy, it may or may not include removal of the head and splitting the carcase in the midline.
- 3.5 Meat  
Any edible part of any carcase (item 3.2) slaughtered according to Islamic rules in the abattoir (item 3.1).
- 3.6 Fresh meat  
Meat (item 3.5) which has not yet been treated in any way to ensure its preservation except that if it has been subjected to refrigeration temperature range -1 to 7°C.

**4- MEAT CLASSES**

- 4.1 Beef meat  
Beef meat shall be classified to the following classes according to age and sex:
- 4.1.1 Veal meat  
Is meat of a male or female bovine animals, less than three months of age, and is characterized by the following:
- Greyish pink lean meat which is smooth and velvety.
  - Soft pliable fat.
  - Red rib bones
- 4.1.2 Calf meat  
Is meat of a male or female bovine animals from three to twelve months of age, and is characterized by the following:

- Greyish red lean meat.
- Harder fat and less red rib bones than veal.

#### 4.1.3 Steer meat

Is meat of a male bovine animal that was castrated at an early age before reaching sexual maturity and before developing the physical characteristics peculiar to bulls.

Age range is from one to two years old and shall comply with the grades stated in item 6.1.

#### 4.1.4 Heifer meat

Is meat of female bovine animal. Age range from 12 month to 24 month old. It complies with grades declared in item 6.1.

#### 4.1.5 Cow meat

Is meat of female bovine animal of more than two years and older. It complies with grades declared in item 6.1.

#### 4.1.6 Bull meat

Is meat uncastrated bovine animal of more than two years and older. It complies with grades declared in item 6.1.

#### 4.1.7 Stag meat

Is meat of male bovine animal that was castrated after it had developed the physical characteristics of a mature bull of more than two year old. It complies with grades declared in item 6.1.

#### 4.2 Mutton

Mutton meat shall be classified according to age as follows:

##### 4.2.1 Lam meat

Is the meat of male or female bovine animals under the age of twelve months and is characterized by the following:

- Small and soft bones, light coloured flesh.
- The break joints of the forelegs can be easily broken.
- The outer covering layer of fat is thin, smooth and has a creamy or slightly pinkish colour.
- The external and internal layers of fat are white and soft.

*NOTE: Meat from ovine animals aged three to five months is called spring lamb, and is distinguished by its light colour and tenderness.*

##### 4.2.2 Yearling mutton

Is meat of male or female ovine animals 12 to 18 months old. The yearling mutton carcass is distinguished from lamb carcass by its harder and whiter bones, darker and coarser flesh. The colour of meat graduated from dark pink to

light red. The external fat layers are firmer and thicker, while the internal fat layers are plentiful and have a slight creamy colour together with an abdominal cavity and longer body and legs. The break joint of the forelegs can be easily broken as lamb but the surface of the joint breakage is rough and porous. If the break joint of the leg is hard to break, it means that the carcass is that of a mature mutton.

#### 4.2.3 Mature mutton

Is meat of male or female ovine animals that are over 20 months old. The carcass is characterized by distended body. The break joints of the forelegs is hard to break. The colour of the meat ranges from light to dark red.

### 5- MEAT CUTS

#### 5.1 Beef

Wholesale beef cuts (as in fig. 1) contains the following:

- 5.1.1 Round meat cut.
- 5.1.2 Rump meat cut.
- 5.1.3 Sirloin meat cut.
- 5.1.4 Short loin meat cut.
- 5.1.5 Flank meat cut.
- 5.1.6 Rib meat cut.
- 5.1.7 Short plate meat cut.
- 5.1.8 Square-cut chuck meat cut.
- 5.1.9 Brisket meat cut.
- 5.1.10 Shank meat cut.

#### 5.2 Mutton meat

Wholesale mutton cuts (as in fig. 2) contains the following:

- 5.2.1 Leg meat cut.
- 5.2.2 Loin meat cut.
- 5.2.3 Rack meat cut.
- 5.2.4 Breast meat cut.
- 5.2.5 Shank meat cut.
- 5.2.6 Shoulder meat cut.

6- MEAT GRADES

6.1 Beef meat

Beef meat shall be graded according to conformation, appearance and quality to the following grades:

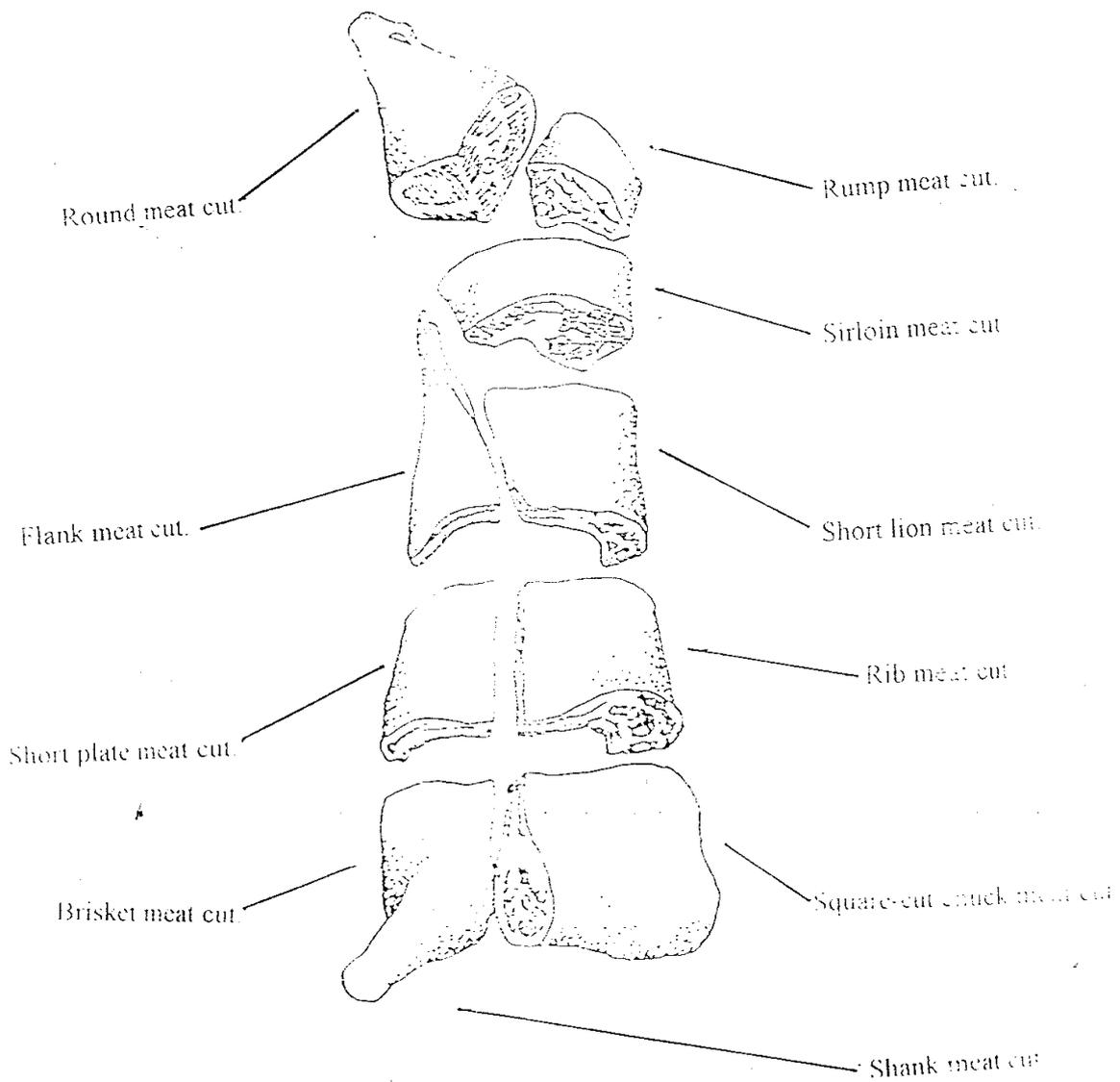


Fig. 1

Wholesale beef cuts  
**Fig. 1**  
**Wholesale beef cuts**

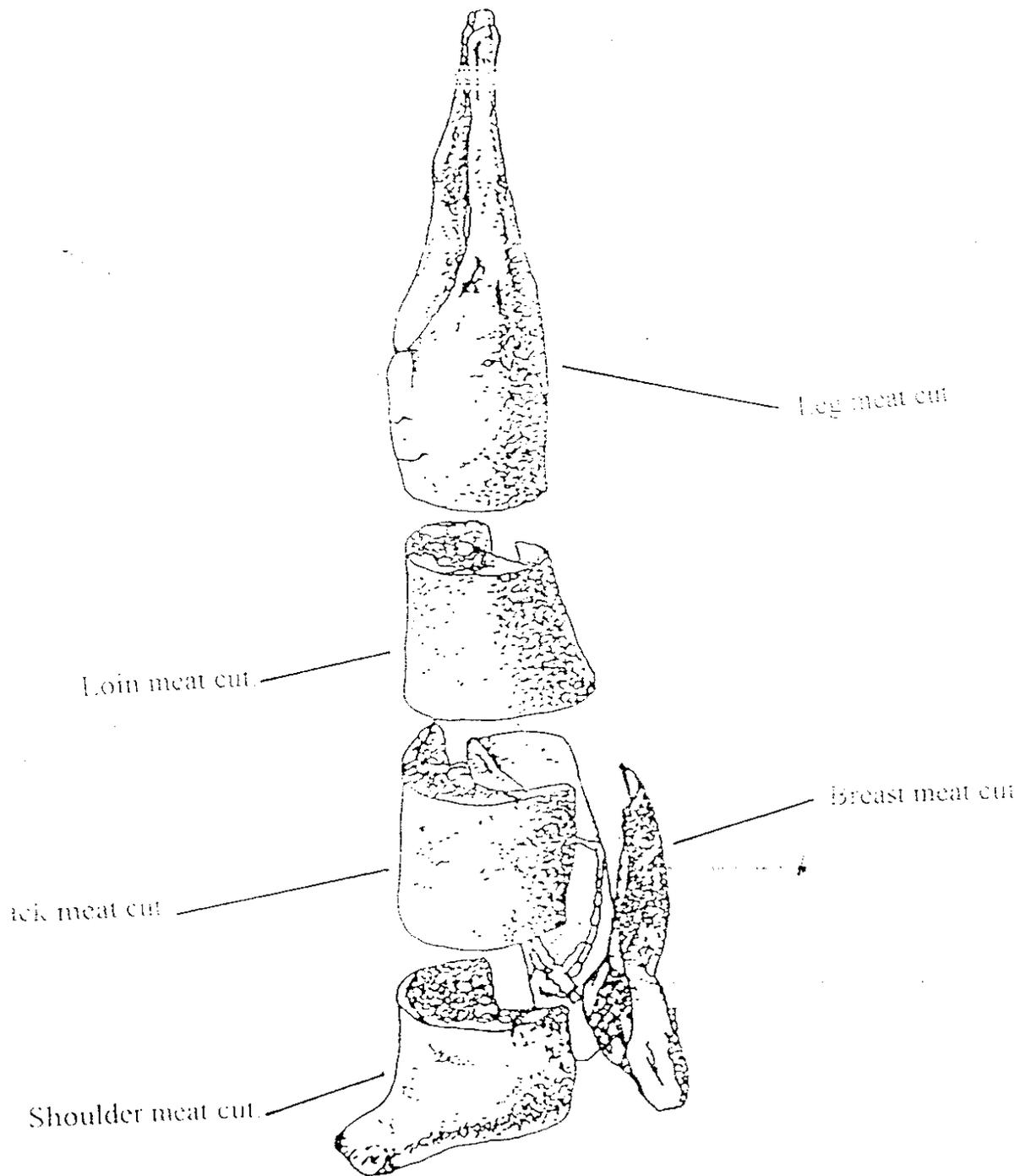


Fig (2)

**Fig. 2**  
**Wholesale cuts of lamb**

#### 6.1.1 Prime grade

The carcass and wholesale cuts are thick-fleshed, blocky and compact. The fat covering is firm, brittle and somewhat waxy. It is fairly smooth and uniformly distributed over the outside of the carcass. The cut surface of the meat has a smooth appearance with liberal quantities of fat interspersed with the lean (marbling). The meat is juicy, tender and flavourful. The colour of the meat may range from pale-red to a deep blood red, but is uniform and bright. The feather bones are usually soft and red, terminating in white cartilages.

#### 6.1.2 Choice grade

The carcass and wholesale cuts are moderately thick-fleshed, blocky and compact. The fat covering of the carcass varies depending upon the age of the animal, from slightly thin in young animals to moderately thick in mature animals. The marbling in the rib eye varies from moderate to moderately abundant depending on the age of the animal. The colour of the meat usually ranges from a light red to slightly dark red. It is usually uniform in colour but may be slightly two-toned. Chine bones vary from soft and red to tinged with white.

#### 6.1.3 Good grade

The carcass and wholesale cuts are slightly thick-fleshed, slightly compact and blocky in appearance. The fat covering of the carcass may be somewhat soft or slightly oily and varies from thin in young animals to slightly thick in more mature animals. The marbling in the rib eye varies from a slight to a modest amount. The colour of the meat varies from light red to slightly dark red but may be two-toned. Chine bones vary from soft and red to tinged with white depending on the maturity of the animal.

#### 6.1.4 Commercial grade

- The carcass of the young animals are angular and slightly thin-fleshed, mature animals are slightly thick-fleshed but irregular in contour.
- Fat covering varies from thin in young animals to moderately thick in mature animals. It is moderately soft or oily in young animals and usually firm in mature animals.
- The rib eye muscle of young animals is soft and watery and has little, if any, marbling, where as in mature animals marbling may be rather abundant but coarse and prominent.
- The colour of the meat varies from slightly dark red to dark red but may be two-toned.
- Chine bones in the young animals are red and in mature animals are hard and white.

## 6.1.5 Utility grade

- The carcasses and wholesale cuts is produced from animals somewhat advanced in age and are usually lacking in natural tenderness and juiciness, rangy, angular and irregular in conformation. They are thinly fleshed.
- The fat covering varies from very thin in young animals to moderate in mature animals and is usually soft.
- The cut surface of the lean muscle is usually soft and watery in the younger animals, fairly firm but coarse in mature animals and shows practically no marbling.
- Colour varies from light red to very dark red and may be two-toned. Bones are usually hard and white.

## 6.2 Buffalo meat

It shall comply with all requirements for beef except for the following differences:

- The buffalo meat is comparatively coarser-grained than beef due to muscle fibres being thicker.
- The fibres are seldom interspersed with fat and the tenderness produced by marbling in beef is generally absent.
- The percentage of dressed weight in buffalo meat is always lower in comparison to the dressed weight of beef due to the former's bulky abdomen, large thick bones, massive head and thick hide.
- The fat in buffalo meat is pure white, while the fat in beef is creamy-white.

## 6.3 Mutton

Mutton shall be graded according to conformation, appearance and quality to the following grades:

## 6.3.1 Prime grade

Carcase of this grade are practically ideal in conformation, finish and quality, attractive in appearance and have symmetrical dimensions. It is compact, blocky, and has short and thick legs. The rack, ribs, loin, shoulder, breast are well fleshy. All fats are firm and of excellent quality. The outer covering of fat is smooth, of moderate depth and evenly distributed over the back and sides. The fat covering is interspersed with strips of pink flesh. The lean flesh is firm in all parts, fine grained and the cut surface is smooth.

### 6.3.2 Choice grade

Carcase of this grade are excellent in conformation, appearance and quality but it is usually slightly deficient in one or more respect as compared with the prime grade. The legs are short and thick. The loin, rib and breast are thick, shoulders are fleshy. The exterior fat is smooth, of good quality and evenly distributed over the ribs, loin and shoulders. The flesh is firm, moderately fine-grained and of proper colour.

### 6.3.3 Good grade

Carcase of this grade are good in conformation, appearance and quality but it is usually slightly deficient in one or more respect as compared with choice grade. Carcase of this grade are reasonably plump but may be slightly deficient in breadth or depth across the backs, hips or shoulders. The carcase are characterized to some extent by long body. The outer covering of the fat layer is smooth, even over the back and hips and little at the flanks and shanks. The interior fat is plentiful but is not evenly distributed. All fats are of good quality and flesh is moderately firm and fine-grained.

### 6.3.4 Commercial grade

The carcase of this grade are moderate in conformation, appearance and quality. The carcase conformation is range, and the neck, shanks and hips are to some extent thin and long. Also the legs are thin and long. Ribs and loin are rather lacking in flesh. The fat layer in carcase of this grade is thin and not well distributed. The flesh is inclined to be soft, spongy and moderately fine-grained.

### 6.3.5 Utility grade

Carcase of this grade are distributed by marked lack of quality and finish, and the high percentage of bone to flesh. The contour of the backbone is plainly visible from neck to tail. There is hardly any exterior fat and interior fat is also lacking. The flesh is generally coarse, fibrous, moist, flabby and dark red in colour.

## 6.4 Goat meat

Shall comply with all requirements for mutton except for the following differences:

- The goat carcase is not so well finished as lamb and mutton carcase and does not yield as high a dressing percentage as average sheep carcase do.
- The goat carcase lack blocky conformation and their carcasses are long, leggy and narrow with little fat covering the exterior.
- The goat meat from older goats, especially bucks, is likely to posses a strong goaty flavour.

**7- PROPERTIES**

The following shall be met in fresh meat:

- 7.1 It shall be produced from animals passed the ante-mortem and post-mortem inspection by the authorized veterinary inspector according to Gulf Standard to be approved by the Organization concerning ante-mortem and post-mortem inspection of slaughter animals.
- 7.2 It shall be produced from animals slaughtered according to Islamic Rules according to Gulf Standard to be approved by the Organization concerning slaughtering requirements according to the Islamic Rules.
- 7.3 It shall be produced from animals slaughtered in an authorized abattoir complying with Gulf Standard No. 21/1984 "Hygienic Regulations for Food Plants and Their Personnel" and Gulf standard to be approved by the Organization concerning code of hygienic practice for preparation, transportation, handling and storing of fresh meat.
- 7.4 The carcass shall be eviscerated, and free from head, feet, and kidney fat. A part of the tail may be left to identify the animal type.
- 7.5 It shall comply with Gulf standard to be approved by the Organization concerning the limits of radiation levels permitted in foodstuffs.
- 7.6 It shall comply with Gulf standard to be approved by the Organization concerning maximum limits for pesticide residues in food products.
- 7.7 It shall have all characteristic properties of the type and grade (item 4, 5, 6).
- 7.8 Addition of preservatives, tenderizing agents, colouring materials, except the stamping ink, are not permitted.
- 7.9 It shall be free from bruises, coloured spots and any signs of spoilage such as off odours.
- 7.10 Meat shall be firm and have a bright appearance.
- 7.11 Residues of hormones and antibiotics shall not exceed the maximum permissible levels according to the Gulf standard to be approved by the organization on maximum permissible levels of veterinary drug residue in food products of animal origin.
- 7.12 Metallic elements contaminating meat shall not exceed the proportion given against each (ppm).

Mercury	0.05
Arsenic	0.5
Copper	20.0
Lead	1.0
Cadmium	0.2

- 7.13 Microbiological criteria shall be as indicated in draft Gulf Standard to be approved by the Organization concerning "Microbiological Criteria for Foodstuffs-Part 1".
- 7.14 The proportion of fatty acids in the fat shall not be more than 1.5 % by weight (as oleic acid).
- 7.15 The total volatile nitrogen percent in the meat shall not be more than 20 mg/100 g meat.

## **8- PACKAGING, STORING, TRANSPORTATION AND HANDLING**

The following shall be met on packaging, storing, transportation and handling.

- 8.1 Packaging
  - 8.1.1 Packaging and wrapping materials shall be hygienic and shall not alter any organoleptic characteristic of the meat. It shall not transfer to the meat any human health harmful substances or contaminate it with any undesirable material.
  - 8.1.2 Packaging materials shall be sound and strong enough to ensure effective protection of the meat during transportation, handling and storing.
  - 8.1.3 Packages or, wraps shall not re-used in packaging or wrapping meat.
  - 8.1.4 Wrapping or packing shall be made in such a way so as to provide full protection for meat cuts from contamination during handling, transportation and storage.
- 8.2 Storing
  - 8.2.1 It shall be stored in a refrigerator and the interior temperature of carcass or cuts shall be between (-1)°C and 7°C.
  - 8.2.2 Unpacked carcasses and cuts shall be hung or placed on suitable corrosion-resistant trays in a manner permitting adequate circulation of air around the meat and precludes drip from one piece falling on to any other piece. Meat shall not touch walls, ceilings or floors.
  - 8.2.3 Amount of fresh meat in the refrigerator shall not exceed its designed capacity. The refrigerator shall be provided with thermometers for measuring and recording the storing temperature.
- 8.3 Transportation and handling
  - 8.3.1 Transportation and handling of fresh meat shall be carried out using transportation means equipped for this purpose. They shall be cleaned before loading and if necessary sanitized. They shall not be previously used for conveying live animals or any substances that affect meat properties.
  - 8.3.2 All internal finishes of transportation means which contact meat shall be corrosion-resistant, smooth and easy to clean and disinfect.

- 8.3.3 Transportation means shall be equipped for hanging carcasses, sides and quarters or for placing meat on suitable trays.
- 8.3.4 Transportation means shall be refrigerated at a temperature ranging from (-1)°C to 7°C and it shall be cooled before loading and cooling shall continue during loading and unloading.
- 8.3.5 Transportation means shall protect meat from dust, insects and other sources of contamination.
- 8.3.6 The fluctuation in temperature of the refrigerator shall not be more than ( $\pm 2$ )°C.
- 8.3.7 Environmental control: To ensure an adequate rate of temperature reduction in the meat, doors should not be left open for extended periods and they should be closed immediately after use. No refrigerated storage facility should be loaded beyond its designed capacity.
- If refrigerating equipment is not manned, an automatic temperature recorder should be installed, or alternatively temperatures should be read at regular intervals and readings entered in a log book.
  - Condensation should be prevented.
  - Rooms should be kept clean and tidy.
  - Refrigeration coils should be defrosted regularly to prevent excessive build-up of ice and loss of efficiency. Defrosting should be able to be carried out without affecting the product.
  - Temperature, relative humidity and airflow should be maintained at a level suitable for the preservation of meat.

## 9- TESTING

### 9.1 Sampling

Sampling shall be taken according to Gulf Standard to be approved by the Organization, concerning Methods of Sampling Meat and Meat Products.

### 9.2 Methods of test

9.2.1 Required tests shall be carried out according to Gulf Standard to be approved by the Organization concerning: Physical Tests for Meat and Meat Products - Methods of Microbiological Examination for Meat, Fish, Shell-fish and Their Products - Method of Detection and Determination of Pesticides, Antibiotics and Hormone Residues in Meat and Meat Products - Methods of Detection of Limits of Radiation Levels Permitted in Foodstuffs.

9.2.2 All tests required to determine its compliance with all items of this standard shall be carried out on the representative sample taken according to item 9.1.

**10- LABELLING**

- 10.1 Fresh meat which has been passed by the official veterinarian inspector as free from contagious diseases and fit for human consumption, shall be branded with a stamp containing the essential labelling according to the regulation in each Gulf country such as meat type, date of slaughtering, code or municipality and quality grade (if the meat is quality graded).
- 10.2 The carcase shall be stamped on each half-carcase, in the following places, at least: external surface of the thighs, loins, back, breast and shoulder.
- 10.3 Cuts obtained in the cutting plants from officially marked carcase must be stamped, unless they are wrapped or packaged.
- 10.4 Wrapped and packaged meat shall comply with Gulf Standard No. 9 "Labelling of Prepackaged Foods" in addition to declaring, meat type, name of cut, quality grade (if meat is quality graded) and slaughtering date and expiration date.

**TECHNICAL TERMS**

Viscera

Bleeding

Dressing

Hips

Conformation

Marbling

Prime grade

Androgenic

Meat classes

Oestrogenic

Ovine

Post-Mortem

Bovine

Rib eye

Thyrostatic

Authorities

Gestagenic

Slaughter animals

Choice grade

Utility grade

Carcase

Feather bones

Chine bones

Tenderizing agents

Cartilages

Anti-Mortem

Loin meat cut

Short loin meat cut

Rib meat cut

Buffalo

Round meat cut  
Rump meat cut  
Shank meat cut  
Rack meat cut  
Leg meat cut  
Square-cut chuck meat cut  
Flank meat cut  
Sirloin meat cut  
Brisket meat cut  
Cabrine  
Cow meat (beef)  
Bull meat  
Stage meat  
Lamb  
Spring lamb  
Mature mutton  
Yearling mutton  
Steer meat  
Heifer meat  
Calf meat  
Veal meat  
Veal  
Two-toned  
Abattoir  
Growth promoters  
Castrated  
Dressing percentage