

इंटरनेट

मानक

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“Step Out From the Old to the New”

IS 2537 (1995): Meat and Meat Products - Beef and Buffalo Meat - Fresh, Chilled and Frozen - Technical Requirements [FAD 18: Slaughter House and Meat Industry]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

**मांस एवं मांस उत्पाद — गौ और भैंस मांस —
ताजा, शीतित और हिमीकृत — तकनीकी अपेक्षाएँ
(पहला पुनरीक्षण)**

Indian Standard

**MEAT AND MEAT PRODUCTS —
BEEF AND BUFFALO MEAT — FRESH,
CHILLED AND FROZEN — TECHNICAL
REQUIREMENTS**

(First Revision)

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

AMENDMENT NO. 1 MARCH 2004
TO
IS 2537 : 1995 MEAT AND MEAT PRODUCTS — BEEF
AND BUFFALO MEAT — FRESH, CHILLED AND
FROZEN — TECHNICAL REQUIREMENTS

(First Revision)

(*Page 1, clause 2*) — Insert reference of the following Indian Standard at the appropriate place:

<i>IS No.</i>	<i>Title</i>
4251:1967	Quality tolerances for water for processed food industry

(*Page 4, clause 6.1.3*) — Insert the following clause after **6.1.3**:

'6.1.4 Quality of water used for processing shall conform to IS 4251:1967.'

(FAD 18)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 APRIL 2011
TO
IS 2537 : 1995 MEAT AND MEAT PRODUCTS —
BEEF AND BUFFALO MEAT — FRESH,
CHILLED AND FROZEN — TECHNICAL
REQUIREMENTS

(First Revision)

[Page 6, clause 8(e)] — Substitute 'Net quantity;' for 'Net mass;'. .

[Page 6, clause 8(g)] — Substitute the following for the existing:

- 'g) Any other marking required under the *Meat Food Products Order*, 1973, the *Standards of Weights and Measures (Packaged Commodities) Rules*, 1977, and the *Prevention of Food Adulteration Act*, 1954 and the Rules framed thereunder.'

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Slaughter House and Meat Industry Sectional Committee had been approved by the Food and Agriculture Division Council.

This Indian Standard was originally published in 1963. This has been revised to make the following changes/additions:

- a) Two grades, namely, *Choice* and *Utility* have been deleted as these are now not being used by the Trade,
- b) Temperature and duration for ageing have been modified,
- c) The microbiological requirements for each of fresh, chilled and frozen material as recommended by Central Avian Research Institute, Izatnagar have been specified, and
- d) The Appendix relating to statement on wholesale and retail cuts has been deleted.

While revising the standard its harmonization with corresponding EC Regulations/Directives was considered by the committee but it was felt that harmonization may not be desirable at this stage as India is not exporting meat to European countries.

In preparation of the standard due consideration has been given to the provisions of *Meat Food Products Order*, 1973 and the *Prevention of Food Adulteration Act*, 1954 and the Rules framed thereunder. However, this Indian Standard is subject to the restrictions imposed under these Order and Act and Rules framed thereunder.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded-off value should be the same as that of the specified value in this standard.

Indian Standard

MEAT AND MEAT PRODUCTS — BEEF AND BUFFALO MEAT — FRESH, CHILLED AND FROZEN — TECHNICAL REQUIREMENTS

(*First Revision*)

1 SCOPE

This standard prescribes the requirements for beef and buffalo meat — fresh, chilled and frozen.

8182 : 1976

Code of hygienic conditions for processed meat products

10171 : 1987

Guide on suitability of plastics for food packaging (*first revision*)

2 REFERENCES

The following Indian Standards contain provisions, which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1982 : 1971	Code of practice for ante-mortem and post-mortem inspection of meat animals (<i>first revision</i>)
4393 : 1979	Basic requirements for an abattoir (<i>first revision</i>)
5402 : 1969	Methods for standard plate count of bacteria in foodstuffs
5403 : 1969	Method for yeast and mould count of foodstuffs
5887	Method for detection of bacteria responsible for food poisoning:
(Part 1) : 1976	Part 1 Isolation, identification and enumeration of <i>E.coli</i> (<i>first revision</i>)
(Part 2) : 1976	Part 2 Isolation, identification and enumeration of <i>Staphylococcus aureus</i> and faecal streptococci (<i>first revision</i>)
(Part 3) : 1976	Part 3 Isolation and identification of <i>Salmonella</i> and <i>Shigella</i> (<i>first revision</i>)

3 TERMINOLOGY

For the purpose of this standard, the definitions and the grouping of the various characteristics of a carcass on the basis of which the grade of a carcass is determined, shall be as given in 3.1 to 3.3.

3.1 Conformation

The term conformation refers to the general build, form, shape, contour or outline of the carcass, side or cuts. The most desired conformation is the one which shall yield the greatest quantity of edible meat. Superior conformation implies short necks and shanks, deep plump rounds, thick backs with full loins, and well-fleshed ribs and smooth shoulders. This is in contrast to ranginess and angularity. In other words, the most desirable cuts, including the loin, rib, round or leg, and chuck and shoulder, have shapely and full muscles and a large proportion of edible meat to bone. Terms expressive of poor conformation are — narrow, shallow, angular, prominent hips (hippy), hollow loins, long-shanked and long-necked, and lacking in plumpness and uniformity.

3.2 Finish

The term finish refers to the quality, amount, colour and distribution of fat. Indications are that fat, within certain limits, increases palatability including juiciness, tenderness and flavour of the meat; it also adds to the general attractiveness of the carcass, side or cut. The best finish implies abundant marbling (intermingling of fat with lean) and a smooth and even covering of firm fat over most of the exterior surface of the rib, etc. The fat should be firm and creamy-white for beef and white for buffalo in colour. In fairly heavy carcasses,

deposits of fat are found around the kidney, the flank and brisket. These are indications of degree of finish. Excessive fat means waste and, therefore, is as undesirable as inadequate finish. Intermuscular fat is the fat distributed between the muscles and is desirable unless it is too excessive. Marbling is the liberal distribution of fat between the muscle fibres or within the muscle. It is the marbling that gives to the muscle the streaked appearance. In buffalo meat the tenderness as produced by marbling in beef is generally absent. This is the fat most desired in beef and buffalo meat, but it is dependent to a certain extent to the quantity of the intermuscular fat and outside covering.

3.3 Quality

The term refers to the factors which affect the palatability, characteristics of cooked meat, such as colour, flavour, tenderness and juiciness. In general, the indications of quality are:

- Red porous bone as contrasted with hard, white and flinty bone.
- Uniformity of the carcass.
- Uniformity of finish, ample marbling.
- Fine texture of muscles, evidenced by smooth and velvety appearance.
- Bright lustre of the cut surface.
- Firmness of lean which means freedom from watery appearance and also freedom from dry appearance.

High quality beef/buffalo meat has a smooth covering of firm, creamy-white fat for beef or white fat for buffalo meat evenly distributed over the exterior. The lean should be uniform and bright. The colour may range from pale-red to deep blood-red. It is well-marbled with fat. The texture of the lean is firm, velvety in appearance and fine in grain. However, the buffalo meat is comparatively coarser-grained than beef due to muscle fibres being thicker and seldom interspersed with fat. The bones in young animals are reddish and porous; and in older animals, white and flinty.

Low quality is indicated by soft or oily fat, dark-coloured lean, coarse appearance, hard bone and poor or no marbling.

A prime carcass combines the highest degree of conformation, quality and finish consistent with palatability.

Generally, the percentage of dressed mass in buffaloes is always lower in comparison to the dressed mass of beef cattle due to the former's bulky abdomen, large thick bones, massive head, thick hide, and rather poorly developed rump.

4 TYPES

4.1 Beef/buffalo meat shall be of two major types, namely carcass form or cut form. The cut form shall be Round, Rump, Sirloin, Short Loin, Flank, Rib, Short Plate, Square-cut Chuck, Brisket and Shank (see Fig. 2).

4.1.1 Both carcass and cut shall be fresh, chilled or frozen.

- | | | |
|--------|---|---|
| Type A | — | Fresh carcass |
| Type B | — | Fresh, chilled carcass |
| Type C | — | Fresh, frozen carcass |
| Type D | — | Cuts, fresh |
| | | a) Round |
| | | b) Rump |
| | | c) Sirloin |
| | | d) Short Loin |
| | | e) Flank |
| | | f) Rib |
| | | g) Short Plate |
| | | h) Square-cut Chuck |
| | | j) Brisket |
| | | k) Shank |
| Type E | — | Cuts, fresh, chilled (as listed under Type D) |
| Type F | — | Cuts, fresh, frozen (as listed under Type D) |

4.2 A chart showing location, structure and names of bones in a side of carcass is given in Fig. 1.

4.3 A chart showing wholesale and retail cuts is given in Fig. 2. The number indicated in wholesale cuts correspond to the locations of cuts indicated in the retail cuts.

5 CLASSES AND GRADES

5.1 Classes

Beef/buffalo carcasses shall be of the following six classes based largely on age, sex and mass of the animal:

- Steer* — A bovine male animal that was castrated at an early age, before reaching sexual maturity and before developing the physical characteristics peculiar to bulls.
- Heifer* — A female bovine animal that has not been served by a bull and has not had a calf or has not developed the mature form.
- Cow/She buffalo* — A female bovine animal that had one or more calves. Barren female bovine animals that have reached maturity and have developed the predominant physical characteristics peculiar to cows or she buffaloes are also classified under this head.
- Bull* — An uncastrated male bovine animal.

- e) *Stag* — A male bovine animal that was castrated after it had developed the physical characteristics of a mature bull.
- f) *Calf* — A male or a female bovine animal of 6 to 12 months of age.

5.2 Grades

Each of the six classes given in 5.1 shall be of the following grades as determined by the conformation, finish and quality of the individual carcasses, sides or cuts:

- a) *Prime* — Prime beef or buffalo meat is the top quality, produced from young and well-fed bovine animals. Prime grade carcasses and wholesale cuts are thick-fleshed, blocky and compact. The fat covering of the carcass varies depending upon the age of the animal, from slightly thin in young animal to moderately thick in mature animals. The colour of the meat usually ranges from light-red to slightly dark red. It is usually uniform in colour, but may be slightly two-toned or shady. Chine bones vary from soft and red in colour to tinged with white.
- b) *Good* — Good grade beef or buffalo meat carcasses and wholesale cuts are moderately

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 colour of the meat varies from light red to slightly dark red but may be two-toned or slightly shady. Chine bones are soft and vary in colour from red to tinged with white.

- c) *Commercial* — Commercial grade beef or buffalo meat carcasses vary, over a fairly wide range, in conformation, finish and quality. 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 slightly thick in mature animals and may be patchy or wasty. It is moderately soft or oily in young animals and usually firm in mature animals. The rib muscle of young animals is soft and watery, whereas in mature animals it is coarse. The colour of the meat varies from light dark red to dark red but may be two-toned or shady. Chine bones in the young animals are red and in mature animals are hard and white.

BEEF CHART

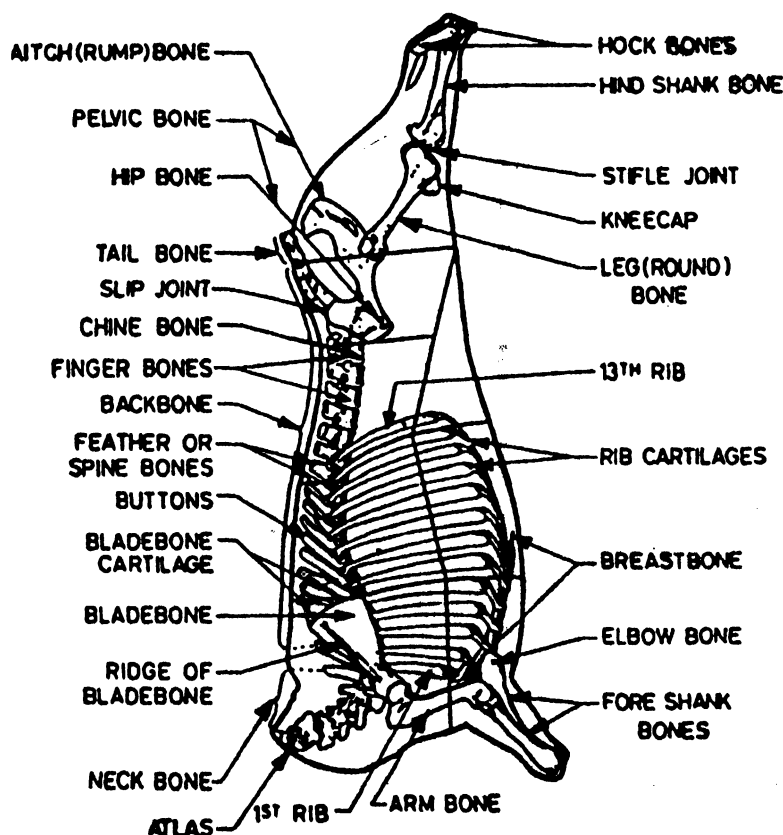


FIG. 1 BEEF CHART SHOWING LOCATION, STRUCTURE AND NAMES OF BONES A SIDE OF BEEF

- d) *Cutter and Canner* — These are the lowest grades of beef or buffalo meat. The meat is less tender but nutritious and wholesome. It is generally cured or canned or used in making sausages and other meat specialities.

6 REQUIREMENTS

6.1 General

6.1.1 The animal from which beef or buffalo meat is derived should be healthy and slaughtered in a hygienically managed slaughter house (see IS 4393 : 1979). The slaughtering should be supervised by a competent authority. The animals and the carcasses thereof shall be subjected to ante-mortem and post-mortem veterinary inspection as prescribed in IS 1982 : 1971 and the carcasses, the sides and the cuts thereof shall be certified as being wholesome and fit for human consumption. The certified carcasses, sides, and cuts shall bear suitable marks of such inspection giving the symbol or allotted num-

ber of the establishment where they are slaughtered and the legend PASSED denoting wholesomeness but not denoting any grade. The marking fluid used for this stamp should be harmless (see 6.4.4).

6.1.2 The carcasses shall be transported from the slaughter house to the processing plant in hanging position in a covered vehicle. If the transportation time from the slaughter house to the processing plant is more than 2 hours, it shall be transported in a refrigerated van, failing which, in a vehicle maintained at low temperature.

6.1.3 The beef/buffalo meat carcasses and cuts shall be handled, chilled or frozen and delivered — fresh or chilled or frozen as the case may be, under hygienic conditions (see IS 8182 : 1976).

6.2 Specific

6.2.1 Type A, Fresh Carcass

The fresh carcass, when delivered shall show no sign of deterioration.

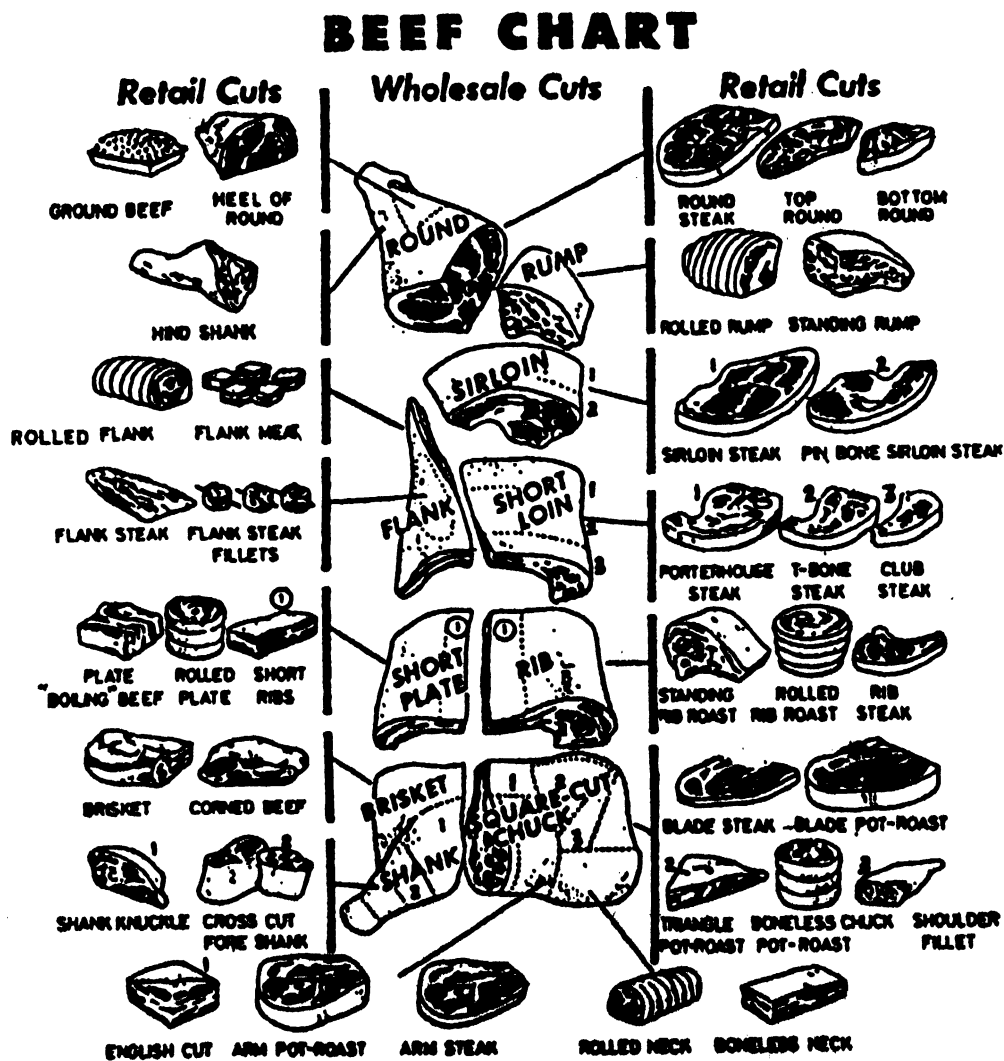


FIG. 2 BEEF CHART SHOWING WHOLESALE AND RETAIL BEEF CUTS

6.2.2 Type B, Fresh, Chilled Carcass

The carcass shall be chilled so that the temperature at the deepest portion of the meat near the bone shall be 4°C or less and shall show no evidence of deterioration.

6.2.3 Type C, Fresh, Frozen Carcass

The carcass, shall be frozen solid (–18°C) when delivered and shall show no evidence of deterioration.

6.2.4 Type D, Cuts, Fresh

These shall be prepared from fresh carcasses of Type A. The cuts shall be well trimmed and cleaned with surplus fat removed.

6.2.5 Type E, Cuts, Fresh, Chilled

These shall be obtained from the carcasses of Type A or Type B within 36 hours and chilled (see 6.4.2).

6.2.6 Type F, Cuts, Fresh, Frozen

These shall be obtained from the carcasses of Type A or Type B within 36 hours and frozen solid (see 6.2.3). The cuts shall show no evidence of refreezing or deterioration.

6.3 Microbiological Requirements

The material drawn from fresh, chilled or frozen carcass/sides/cuts shall comply with the microbiological requirements as prescribed in Tables 1, 2 and 3 respectively.

Table 1 Microbiological Requirements for Beef/Buffalo Meat, Fresh
(Clause 6.3)

Sl No.	Organism	<i>n</i>	<i>m</i>	<i>M</i>	<i>c</i>	Method of Test, Ref to
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Aerobic plate count/g	5	1×10^6	5×10^6	3	IS 5402 : 1969
ii)	<i>E. coli</i> /g	5	5×10^1	5×10^2	2	IS 5887 (Part 1) : 1976
iii)	<i>Salmonella</i> in 50 g	5	0	—	0	IS 5887 (Part 3) : 1976
iv)	<i>S. aureus</i> /g	5	1×10^1	1×10^2	2	IS 5887 (Part 2) : 1976
v)	Yeast & mould/g	5	1×10^4	5×10^4	2	IS 5403 : 1969

Table 2 Microbiological Requirements for Beef/Buffalo Meat, Fresh, Chilled
(Clause 6.3)

Sl No.	Organism	<i>n</i>	<i>m</i>	<i>M</i>	<i>c</i>	Method of Test, Ref to
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Aerobic plate count/g	5	1×10^5	5×10^6	2	IS 5402 : 1969
ii)	<i>E. coli</i> /g	5	1×10^1	1×10^2	1	IS 5887 (Part 1) : 1976
iii)	<i>Salmonella</i> in 50 g	5	0	—	0	IS 5887 (Part 3) : 1976
iv)	<i>S. aureus</i> /g	5	1×10^2	1×10^3	1	IS 5887 (Part 2) : 1976
v)	Yeast & mould/g	5	1×10^1	1×10^2	1	IS 5403 : 1969

Table 3 Microbiological Requirements for Beef/Buffalo Meat, Fresh, Frozen
(Clause 6.3)

Sl No.	Organism	<i>n</i>	<i>m</i>	<i>M</i>	<i>c</i>	Method of Test, Ref to
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Aerobic plate count/g	5	1×10^3	1×10^5	2	IS 5402 : 1969
ii)	<i>E. coli</i> /g	5	0	1×10^1	1	IS 5887 (Part 1) : 1976
iii)	<i>Salmonella</i> in 50 g	5	0	—	0	IS 5887 (Part 3) : 1976
iv)	<i>S. aureus</i> /g	5	1×10^1	1×10^2	1	IS 5887 (Part 2) : 1976
v)	Yeast & mould /g	5	1×10^1	1×10^2	1	IS 5403 : 1969

where

n = number of samples to be tested.

m = maximum permissible number of relevant bacteria. The values above this are marginally acceptable or unacceptable.

M = level at or above which the lot has to be rejected.

c = maximum allowable number of sample units having microbiological counts between *m* and *M*.

6.4 Other Requirements

6.4.1 Ageing

Carcasses may be aged for a period of 2 weeks at a temperature of 5 to 6°C.

6.4.2 Chilling

Fresh carcasses, sides or cuts, meant for chilling should be brought to a temperature of about 5 to 6°C within 24 hours. The chilled material should be consumed within 2 to 3 weeks under normal conditions of storage.

6.4.3 Freezing and Storage

6.4.3.1 The carcasses, sides or cuts, shall be pre-chilled before freezing and the freezing completed at -18°C or lower temperature within 24 hours.

6.4.3.2 Frozen carcasses, sides or cuts, shall be stored at -18°C or lower temperature and the material shall be consumed within 9 months.

6.4.4 Stamping Ink and Stamping

6.4.4.1 The stamping ink used for inspection marks or grade marks shall be of harmless material.

6.4.4.2 A suitable stamping ink is a solution containing 1 to 2 percent fuchsine in acetic acid. The fuchsine is dissolved first in just enough acetic acid to bring about the solution and then glycerine is added to make up the required quantity. Alternatively, a stamping ink prepared according to the following formula may be used:

Water	1 636 ml
Ethyl alcohol	1 363 ml
Cane sugar	450 g
Methyl violet	35 g

Sugar is dissolved in water, then alcohol is added and finally the methyl violet is added. The solution is stirred and allowed to stand for 12 hours before use.

6.4.4.3 Grade designation markings on the carcass, side or cuts shall be applied with a roller rubber stamp.

7 PACKING AND TRANSPORT

The fresh and chilled material shall be delivered in clean and hygienic conditions. The frozen material, unless agreed to otherwise between the purchaser and the vendor, shall be wrapped in food grade polyethylene film (*see* IS 10171 : 1987) or any other flexible packaging material or packed in carton.

The fresh, chilled and frozen material shall be moved in refrigerated transport and the packages shall be handled under hygienic conditions (*see* IS 8182 : 1976). At the port, the loading of the packages shall be done by using canvas slings. The packages shall not be exposed to direct sun or rain.

8 MARKING

The packages/consignments shall be marked to give the following information:

- Name of the material;
- Type, class and grade of the material;
- Batch or code number;
- Number of pieces;
- Net mass;
- Date of slaughter/packing; and
- Any other markings required under the *Meat Food Products Order, 1973* and the *Prevention of Food Adulteration Act, 1954* and the Rules framed thereunder.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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