

## FOOD SPECIFICATIONS

### VEGETABLE FRESH

#### General

1. The fresh vegetables will be crisp, well formed, of proper tender maturity and shall not be with coarse fibres, stringy, old or hard due to over age and over growth, spongy or fluffy due to age. The vegetables shall be those in season commencing from early season arrivals and also late season receipts. These will be freshly gathered, cleaned, graded for soundness and wholesomeness. Botanically fruits of plants, roots, leaves, stems, flowers and modified forms of stems, roots and leaves constitute vegetable fresh for human consumptions.
2. The vegetable fresh shall be free from insect infestation, physiological disorders, blemishes of damage and disease. They shall also be free from discolouration, injury, damage or signs of improper storage, handling and transportation, which renders them a poor look as to the freshness.
3. The vegetable fresh shall be free from rotting, coating of waxes, mineral oil and colours.
4. All mandatory requirements of FSSAI Rules, as amended from time to time, pertaining to this specification shall be complied with.
5. The vegetable can broadly be classified into :-
  - (a) Root varieties.
  - (b) Creeper varieties.
  - (c) Leafy varieties.
  - (d) Fruits/surface/overground varieties.

#### Root Varieties

6. This category includes the modified roots and stems used as food like Arvi, Carrots, Radish, Turnips, Ginger and the like. The important features of these varieties are discussed in succeeding paras.
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7. These vegetables shall be well formed and not forked or misshapen, over or under-grown. The surface shall be characteristic of type but free from growth cracks/hardened body and fibrous cores. The leaves of root vegetables shall be removed 5 cms from the crown and trimmed to remove tail and root portion.
8. **Arvi.** It has a wide range of physical classification, starting from small sized bulbs to large sized bulbs from round shaped to faizabadi elongated long sized Arvi. Arvi shall be soft in texture, free from field fungal diseases and hardening of bulbs which is evident with partial decay of degeneration of portion of bulb.
9. **Carrots.** The varieties of carrots range from golden yellow, light red, bright orange to deep orange-red colour. The greenish white or country carrot and also yellowish white are hard, coarse and insipid. Carrots should be smooth and regular, of good size, should break crisp, having a fine skin and sweet tender flesh. It should not be tough, stringy with leathery skin, fibrous flesh or with excessive heart. The varieties of carrots are namely Pusa Kesar, Pusa Meghali and Half-long-Nantes, Pusa Yamdagni & coreless. The size of carrots shall be not less than 12 cm and not more than 30 cm. Top should be denuded of foliage.
10. **Radish.** The radish varies in size according to the area in which it is grown. They should be smooth and regular, of good size, should break crisp, having a fine skin, juicy and of good flavour. It

should not be tough with fibrous flesh and wanting in flavour which indicates inferior quality and overgrown roots.

11. **Turnips**. The turnip belongs to the family cruciferae, genus Brassica and species rapa. They should be clean and fresh in appearance, of good size and regular shape, free from all cracks. The flesh should be crisp, tender, fine grained, solid, sweet, juicy and of good flavour. Loose wrinkled skin, softness, discoloured appearance due to staleness, and bad storage are chief defects. Toughness, cracked skin, hard and fibrous flesh and wanting in flavour denote inferior quality and overgrown roots. The top shall not be more than 1.0 cm.

12. **Ginger**. It is the bulbous root of ginger plant. It should be fresh, should break crisp, having a fine stain, tender and juicy flesh. It should give a slightly bitter taste. Bruised and discoloured skin are caused due to bad packing and rough handling. Toughness, hardness and excessive fibrous flesh wanting in juice and flavour indicate inferior quality and overgrown roots.

13. **Beet Root (Chukandar)**. Well formed bulbs, proper stage of maturity with soft secondary roots of bright reddish purple colour. These bulbs will be free from sogginess and attacks of field fungi or disease. Max numbers of Beetroot in a kg can be 10 with each single piece not less than 100 gms.

14. The vegetable like, beans, cucumber, pumpkin, snake gourd, tinda, bitter gourd, chappan kaddu, marrow, ridge gourd, ribbon gourd, tori ghia, tori jhinga and long melon etc. form part of this category of vegetables. These vegetables are susceptible to damage by field fungi and various other insects, thus, making them unsuitable for human consumption.

15. These vegetables shall be well formed, tender of proper stage of maturity. Surfaces not facing sun may have little under distribution of chlorophyll thus slight light yellow in colour, this should not be taken as a major defect. Skin shall be moist, smooth and with velvety feeling. Presence of hard seeds, hard skin, bitterness, shrinkage and physiological disorders are defects and vegetable with these defects shall be rejected. The details of vegetables are discussed in succeeding paras.

16. **Beans**. This category includes cluster beans, broad beans, french beans, soya beans, moong beans, bengal beans etc. They should be young, tender and fleshy, not hard, wrinkled, stringy or discoloured.

17. **Cucumber**. It should be smooth and regular, of good size and shape, should be filled with tender flesh and seeds. It should not be over ripe, loose or with wrinkled skin which denote staleness. The cucumber shall be of varieties namely Field Grown slicing or Table -sorts, Packing varieties and Forging or Green house varieties of size between 8 cm and 50 cm.

18. **Snake gourd**, Ridge gourd, Ribbon gourd, Sponge gourd, Tori ghia, Tori Jhinga and Squash. These should be smooth, tender and of good size. The colour is normally fresh light green and not yellowish or rusty brown which denotes staleness. The interior should be fleshy, soft and tender, not hard and stringy which denotes over ripeness or inferior quality.

19. **Pumpkin**. It should be of good size with tender skin. It may be of fresh green colour to rusty brown. Once it is fully matured and turns into rusty brown colour, it can be stored for long period. The skin should be free from any damage and field fungi or disease. The damage on outer skin is the sign of bad handling and storage.

20. **Tinda**. It should be round shape with smooth skin of fresh light green colour or they may have fresh off white velvety appearance. The interior should be fleshy with small and soft seeds. The skin should be soft and tender and not hard which denotes over ripeness or inferior quality. The hard seed also conform over ripeness of tinda.

21. **Bitter Gourd**. It should be of good size and shape with bright green colour knotted skin. It should break crisp and have tender flesh. The yellowish or rusty brown colour indicates over ripeness or inferior quality.

22. **Chappan Kaddu**. This should be smooth and regular of good size, having fine skin and sweet tender flesh. Hardness of skin and seeds and wanting of flavour denote inferior quality and over ripeness.

23. **Marrow.** It should have fresh green colour tender skin. The interior is filled with soft whitish pulp and tender seeds. Hard yellowish skin and hard seeds indicate over ripeness and inferior quality. It should be free from any damage and disease.

24. **Long Marrow.** It is normally ribbed and long shaped of fresh green colour with velvety appearance. The interior flesh is filled with soft tender seeds and watery pulp. The yellowish colour, hardness of skin and seeds denote over ripeness and inferior quality. Leafy Varieties

25. The vegetables like amaranth, lai sag, fenugreek, cabbage, karam sag, rape sag, spinach, coriander green, mint green etc. form part of this category.

26. **Amaranth, Lai sag, Fenugreek, Karam sag, Rape Sag, Spinach (Including Aizoaceae, Buck Wheat, Sarren, Chakwat etc), Bathua, Corriender green and Mint green.** The leaves of above varieties vary in size and shape. They should be fresh, bright, soft and succulent, not stale withered and dry due to being kept too long or exposed to the sun after being plucked. The leaves should be free from disease and any type of infestation. Tough, coarse and stringy leaves denote that the crop is over grown, has been badly cultivated or is of inferior quality. These will be properly trimmed and will be free from roots, stumps, hard stalks and extraneous leaves. Fruit/Surface/Overground varieties

27. Peas green, knol-khol, brinjal, cauliflower, cowpeas (lobia green), ladies finger, plaintain green, tomatoes, capsicum, chow-chow green papaya, jack fruit, marrow, nadroo (kamal kakri), parwal, squash, chillies green and coconut whole etc. are from this category of vegetables. The details of above varieties of vegetables are discussed in succeeding paras.

28. **Peas.** The pods should be of fresh green colour, crisp, juicy and of good size. They should be well filled with fresh light-yellow, green, dark green or white unwrinkled peas of good size, tender, thin-skinned, sweet and full flavoured. Over ripe, flat ill filled pods containing a few puny small peas, denote inferior quality and bad cultivation. Dull, yellowish green, hard pods containing hard dry light peas are stale and bad. Peas attacked by insects will be empty and light in weight owing to kernel having been eaten up. The peas are of varieties namely Early variety (Asauji and meteror smooth seeded varieties), Early badger (A wrinkle -seeded, dwarf variety), Arkel ( A wrinkle-seeded high yielding dwarf variety), Mid season (Bonneville: Wrinkle-seeded, double podded, medium tall variety) and late variety (N.P.29: wrinkle –seeded). Varieties suitable for hills: Early Giant (Dark pods with wrinkled seed) and Alderman (Pods more or less straight nearly 9 cm in length).

29. **Knol-Khol.** They should be clean and fresh in appearance of good size and regular shape. It should have well formed body and soft flesh. The discoloured appearance due to staleness and bad storage are chief defects. Toughness, hard and fibrous flesh denote inferior quality.

30. **Chow-chow and Brinjal.** The colour of brinjal varies, they may be white to yellow or dark purple. They should have fresh looking shiny skin. The thinner skin, the better the brinjal. It should be well filled with soft greenish pulp and tender seeds which should not be in excess. It should not be over-ripe, loose or with wrinkled skin which denotes staleness.

31. **Cauliflower.** This should have large, firm snowy-white compact head of uniform closeness. Any tinge of green or yellow indicates inferior quality. Some varieties of good quality when fully matured, become suffused with violet. The less foliage the better, small dark spots or soft spots denote decomposition. They should normally be delivered with two layers of leaves of sufficient length to protect the flower and stalk removed. The varieties of Cauliflower are classified as Early (Kunwari or Kauri and Early Patna available from mid-September to mid-October), Pusa Ketki and Pusa Deepali available in October - November Mid-Season (Aghani, Poosi, Patna Main Crop, plant Shubhra –

available from mid-November to mid-December. Early snowball, Giant Snowball, D-96, Japanese Improved, Pusa Shubhra - available from mid-December to mid-January) and Late (Dania-available in January -February, snowball -16 Pusa snowball 1-2 and Pusa Himjyotiavailable from mid-January to April)

32. **Cowpeas (lobia green).** They should be young, tender, fleshy and filled with soft and tender seeds. These should not be hard, fibrous, wrinkled, stringy or discoloured.

33. **Ladies Finger or Bhindi.** The pods of these vary, some are ridged, others are not. The colour is either fresh, light green or they have fresh white velvety appearance, not yellowish or rusty brown denoting staleness. The interior should be fleshy and seeds small and soft. A dry and stringy interior, with hard seeds is due to over ripeness. The skin should be soft and tender not hard and stringy which denotes over ripeness or inferior quality. The ladies finger are of varieties namely Makhmali, Pusa Sqwani, Perkin's Long Green, Vaishali Badhu, Punjab Padmini and Parbani Kranti. The tail end of ladies finger shall break crisp without any signs of fibrous formation.

34. **Plaintain Green.** These should be smooth and regular with fresh appearance. It should break crisp and interior should have good creamy white pulp. Toughness, cracked skin and wanting in flavour denote inferior quality. These are available in different sizes according to the area where these are grown.

35. **Cabbage.** These will be green in colour, should be fresh, crisp and firm with a large compact heart and as few loose outer leaves and as little stalk as possible. The different varieties of cabbage are Round head or Bell head type, Flat head or Drum head type (Pusa Drumhead), Conical head type (Jersey wake field) and Savoy type (Chieftain).

36. **Tomatoes.** These should be of good fresh appearance and ripe colour, good size, firm, solid, plump, well filled and heavy. The flesh should be plentiful, rich, solid, tender of good colour. It should have a pleasant, not too bitter flavour. Smaller the core and less seeds the better the tomatoes. Greenish, tough skinned, lumpy and sour flesh (due to unripeness) dry wrinkled, discolour skin and a watery pulpy interior shows staleness and poor quality. Bruised and discoloured tomatoes are caused due to bad packing and rough handling and loose their taste and flavour. The different varieties of tomatoes are Pusa Early Dwarf, Pusa

Fuby, Sioux Marglobe, Best of all, La Bonita, Pusa 120, Pusa Sheetal, Pusa Gaurav, Italian Red Pear and Rema.

37. **Chillies.** These will be of good size as per variety with fresh and bright in appearance. Should break crisp, well filled with soft seeds and free from field fungi or any other disease. Loose or damaged skin denote bad handling/storage and inferior quality. The size of individual chillies shall not be less than 2.0 cm.

38. **Capsicum.** These will be of bright green colour, fresh and break crisp. The skin will be light, solid and free from any damage due to handling, storage or disease. The interior will partially contain tender seeds. Discoloured capsicum with hard seeds are over-ripe and loose their taste and flavour.

39. **Green Papaya.** It should be smooth and regular of good size, well shaped of green colour. The skin should be thin with creamy white pulp, minimum of seeds and pleasant flavour. The discolouration and damage to skin are the sign of long storage and bad handling.

40. **Parwal.** These should be smooth and regular, of good size and shape with fine skin and tender flesh. The interior will be filled with creamy white pulp and soft seeds. The hard seeds and discolouration of skin are the signs of over ripeness and staleness.

41. **Jack fruit.** This should be of green colour, solid, young and good size. The interior should be filled with whitish pulp and tender seeds. When cut the milky substance, should come out. If it is over mature, it can not be used as vegetable, should be free from any disease and softness of skin shows the sign of staleness and long storage.

42. **Fresh Lime (Kaagzi Nimbu).** Fresh lime shall be of two types namely round and oval. The lime fresh shall show a green rind colour just beginning to turn yellow or uniform golden yellow, rind not soft or flabby, shall be free from bruises, injury, damage, canker and discolouration. The minimum weight of single fresh lime shall not be less than 30 gm and maximum number to a kg shall be 33.

43. **Radish Fruit (Singri).** On maturity the radish top bear fruit which are used as vegetable. They are bitter in taste and when cooked produces excellent vegetable. The fruit pod is a cilicle which is about 2.5 to 7.5 cm in length and does not become open to discharge the seeds at maturity. Best used when the seed is very tender inside the pod.

44. **Leek.** The leek resembles the onion in its adaptability and cultural requirements. Instead of forming a bulb the leek produces a thick, fleshy cylinder that has the characteristics of large green onion. The main varieties of leek are London flag and American flag. Under favourable conditions they grow to 4 cm in diameter or more and from 15 to 20 cm in length. The plant is larger than onion. Inspection

45. The fresh vegetables will be subjected to the approval of local supply officer after his careful inspection and having found them conforming to this specification. The decision of this officer shall be final.

46. All vegetables shall be supplied in suitable clean containers designed to protect them from damage, deterioration and contamination of any kind.

47. An excess of earth on root vegetables amount to adulteration, they should be tendered clean. The contractors must not give bright appearance to the vegetables especially of green leaf by washing them. This is important as water used for the purpose is often filthy and germ laden. Some suppliers soak the vegetables to increase weight, which can be detected easily by their damp and sodden feel, and their over bright and pulpy state. Note:- A regular and proper schedule of supplies shall be drawn by the contract concluding authority from the various genus of vegetables as reflected at Appendix `A'. The instructions at Appendix `A' shall act as guide to officers concluding and operating the contract and will not form part of the tenders.

The vegetables shall be selected from the following kinds only :-

GENUS `A'

1. Beans cluster (Gowar)
2. Beans broad (Bakla Sem)
3. Beans French (Vilayti Sem)
4. Soya beans
5. Moong beans
6. Bengal Beans
7. Brinjals (Baigon)
8. Cauliflower (Phool Ghobi)
9. Lady Finger (Bhindi)
10. Peas green (Hari Mutter)
11. Pumpkin (Petha Kaddu)
12. Cowpeas
13. Cucumber (Khira)
14. Snake Gourd
15. Tinda
16. Arvi
17. Plantain green GENUS `B'

1. Fenugreek (Methi)
2. Carrots Country (Desi gajar)
3. Cabbage (Band Ghobi)
4. Spinach country (Deshi palak)
5. Rape Sag (Sarson) stem
6. Rape Sag (Sarson) leaves
7. Tomatoes ripe
8. Amaranth (Chulai Sag)
9. Carrots English (Vilayati Gajar)
10. Lai Sag
11. Karam Sag
12. Knol Khol (Ganth Ghobi)
13. Bitter Gourd
14. Leek
15. Bathua GENUS `C'

1. Corriander green (Dhania Sabz)
2. Ginger green (Adrak)
3. Chillies green
4. Mint green (Podina)
5. Coconut whole
6. Fresh Lime ( Kagzi Nimbu)

1. Jack fruit green (Kathal)
2. Parwal (Oarwar)
3. Raddish country (Desi Muli)
4. Turnips (Saljam)
5. Bottle gourd (Ghia)
6. Marrow (Kaddu)
7. Long Melon (Kakri)
8. Chow chow (a type of Baigon)
9. Tomatoes green
10. Spong gourd (a type of Tori)
11. Ridge gourd (a type of Tori)
12. Tori Jhinga

13. Green papaya
14. Capsicum
15. Nadroo

16. Ribbon gourd
17. Radish Fruit
18. Squash
19. Beet Root (Chaukinder).

The varieties of vegetables to be supplied will be fixed by the local authority making the contract in consultation with the local agricultural and medical authorities concerned.

A list of these vegetables, based on the kind, either locally grown or imported, shall be prepared and included in the contract. Local varieties if approved by Army Medical authorities may be included in the list. Note :-

(a) Genus `A' Vegetables of this genus, taken altogether should not be less than 35% and not more than 40% of a day's vegetable ration.

(b) Genus `B' Vegetables of this genus should be taken for a day's vegetables ration as under :-  
During Season During off Season (Nov to Mar) (Apr to Oct) Not less than 35% Not less than 25%  
Every effort will be made to supply Genus `B' items as specified. But the shortfall may be made up by items other than from Genus `C'.

(c) Genus `C' Vegetables of this genus, taken altogether should not exceed 5% of a day's vegetable ration.

(d) Genus Unclassified. Balance of a day's vegetable ration should be taken from this genus.

(e) Genii percentages will be completed on fortnightly basis except in ASSAM, MEGHALAYA, NAGALAND, ARUNACHAL, MIZORAM, TRIPURA, MANIPUR and NORTH BENGAL including SIKKIM in Eastern Command where it will be completed on a monthly basis.

The genii percentages of items under Genus 'C' which are for garnishing purposes will, however, be completed on daily basis. It will be ensured that :-

- (i) Variety is provided and no monotony is allowed to occur in the diet.
- (ii) Green leafy vegetables are issued within short periodicity.

**SECRETARIAT OF THE TECHNICAL STANDARDISATION COMMITTEE (FOOD STUFFS) (DIRECTORATE GENERAL OF SUPPLIES AND TRANSPORT)**  
**DEFENCE FOOD SPECIFICATIONS-2020**  
**SPECIFICATION NO 404 : POULTRY LIVE (FOWL/CHICKEN)**

**Quality**

1. Poultry live (Fowl/Chicken) shall be healthy and well nourished birds of good confirmation. The birds tendered shall be plumpy (i.e. the breast bone being well covered with flesh).

2. The birds shall be of the following age and weight:-

	Age in Weeks	Live weight in Kg	
		Min	Max
(a) Broiler	6-10	1.5	2.0
(b) Culled fowl/chicken	52-72	1.5	2.5

3. For definition of birds mentioned above refer to Appendix 'A' to this specification.

4. Under normal circumstances broiler will be acceptable however, under exceptional circumstances at the discretion of the CFA culled fowl/chicken may also be accepted. Ducks, jungle bird fowl, waterfowl, turkey, guinea fowl, or any other bird shall not be acceptable.

5. The eyes of the live birds shall be healthy, bright, nostrils free from discharge, combs and wattles firm and bright in colour, feathers glossy, movements active and showing no evidence of diarrhoea or any other disease or infection. The birds shall be free from diseases/infections of all types.

6. The proof of age of the birds shall be assessed by the colour of the feather, flexibility of the breast bone cartilage and colour of the combs and wattles through visual inspection (see appendix 'A' to this specification).

7. The birds shall be inspected before acceptance by an Army Veterinary Officer. Where no Army Veterinary Officer is available, such inspection will be carried out by the local Supply Officer.



**APPENDIX 'A' TO  
SPECIFICATION NO 404  
FOR POULTRY LIVE  
(FOWL/CHICKEN)**

1. Definition of Broiler:-

(a) Broiler : A young meat type chicken 6 to 10 weeks of age of either sex, that is tender meat with soft, pliable, smooth textured skin, flexible breast bone, white feather and yellow skin.

(b) Culled fowl/chicken: A matured fowl/chicken of either sex, 52 - 72 weeks of age with toughened and darkened meat and non flexible breast bone due to hardening of the cartilage.

2. Identification of age :-

(a) A young fowl/chicken shall have glossy feather, bright, firm and sharp pointed combs, legs with smooth small scales and unfeathered shanks. The male birds shall have spurs which are small and under-developed.

(b) The older birds have faded, worn-out and broken plumage. The birds are generally dark in colour and have a coarse body texture with toughened muscle fibre with non flexible and hardened breast bone cartilage.

**SECRETARIAT****OF****THE TECHNICAL STANDARDIZATION COMMITTEE (FOOD STUFES)  
(DIRECTORATE GENERAL OF SUPPLIES AND TRANSPORT)****DEFENCE OOD SPECIFICATION - 2023****SPECIFICATION NO 357 (A) (TEMP) : EGGS FRESH****Quality**

1. The eggs shall be fresh hen eggs of good size. The weight of single tray of eggs bearing 30 eggs (excluding the weight of tray shall not be less than 1560 gm.
2. The shell of the eggs shall be sound and free from stain, discoloration and adhering excretes/ foreign matter cracked and dirty eggs shall be discarded.
3. However, eggs having adhering excretes of extraneous matter but cleaned with water and dried may be accepted.

**Inspection**

4. The eggs shall be subjected to following tests for adjudging its degree of freshness :-
  - (a) **Salt Water Test**
    - (i) Eggs which sink to the bottom when immersed in 10% salt solution are fresh eggs.
    - (ii) Eggs which afloat at the centre or float on the top of 10% salt solution shall be discarded/rejected being either marginally stale or definitely bad.
  - (b) **Light Test.** This test shall be carried out on a property made commercially available or improvised box constructed as per Appendix 'A' to this Specification:-
    - (i) Eggs when viewed against light in vertical position by placing on the holes of the box one by one shall be transparent such eggs are fresh once.
    - (ii) Eggs which are opaque on translucent shall be discarded being state eggs.
  - (b) **Visual Test** Eggs shall be broken into two halves In such a manner that the membrane of the egg yolk is not ruptured. Pour the contents of the egg on a plate and observe the shape and size of the yolk and spreading of the egg whites for following inferences in regard to the state of freshness of the eggs :-
    - (i) Egg yolks having good close and compact shape with bulged height and egg whites close to the yolk. Such eggs are less than 3 to 4 days old.

- (ii) Egg whites spread out and egg yolk enlarged to slightly bigger size with slight depression of the bulge. Such eggs are around 7 to 9 days old.
- (iii) Egg white spread out in irregular shape and egg yolk flatten and increases to about double the size. Such eggs are around 15 days old.
- (iv) Egg yolk and egg whites mix up into a liquid. Such eggs are deteriorated and bad.

### **Packing**

5. The fresh eggs shall be tendered in virgin machine made paper pulp trays for inspection and acceptance by the supply officer whose decision shall be final and binding. Re-cycled paper trays shall not be used. The paper pulp trays used for packing fresh eggs shall be clean, sound, dry and free from signs of any damage. The cost of egg tray he shall have no claim for these to be returned to him.

**APPENDIX 'A'**  
**SPECIFICATION NO 357 (A) (TEMP)**  
**FOR EGGS FRESH**

**"CONSTRUCTION OF LIGHT TESTER FOR EGGS FRESH"**

1. Take a wooden box of suitable size with detachable lid.
2. Make number of holes in the top lid (diameter of holes shall be around 30 mm) to make egg stand in vertical position on its tapered end.
3. Paint interior of the box with good ultra white enamel paint.
4. Fix an electric bulb of 100 watts to provide sufficient illumination alongwith electricity connection, off/ on switch cord etc.

**SECRETARIAT OF THE TECHNICAL STANDARDISATION COMMITTEE (FOOD STUFFS)**  
**(DIRECTORATE GENERAL OF SUPPLIES AND TRANSPORT) DEFENCE**  
**FOOD SPECIFICATIONS-2020**

**SPECIFICATION NO 359 (REVISED) : FRUITS FRESH**

**PART- I: GENERAL SPECIFICATION**

**Quality**

1. **General.** All fruits fresh will be fresh, ripe, sound, sweet, wholesome, mature, well formed, firm, of good even size. It will have characteristic colour, taste, aroma, shape and visual appearance, as applicable to each fruit fresh and its varieties. The fruit fresh should mature naturally on trees or under normal storage conditions. It will be practically free from insects and pests infestation (live or dead) and foreign matter and totally free from fungal or bacterial rot (skin or pulp). It will have no holes, cuts, cracks, wounds or bruises (indented or water soaked). It will have no discoloration of skin, internal break down, browning, scabs, wrinkled or water soaked skin, blemishes, physical injury, diseases or any other defects. Physiological disorders and temperature injury (heat, chill, freeze) should not be seen in it. It will also be free from signs of improper storage, handling and transportation. It will not be bland, bitter, sour in taste, dry/ dehydrated, overripe. It will also be free of any other defects that may have poor visual appeal, injurious to health or poor organoleptic quality.

2. **Cold Storage.** Fruits fresh from cold storage may be accepted provided that it possess all qualitative requirements as applicable to fruits fresh and have not undergone any physiological damage, deterioration or ripening staleness, due to low temperature treatment. Such fruit fresh shall be free from freeze burns and shall be properly thawed. Cold storage fruit fresh in any case will not be accepted during the natural availability season of that fruit fresh, including early and late maturing. These will also be free from abnormal external moisture, excluding slight condensation following removal from cold storage.

3. **Size and Weight relationship.** Fruits fresh will conform to the requirements of size/weight relationship as given in succeeding paragraphs in this specification. Fruits fresh of abnormal shape, size, weight, etc likely due to growth enhancers/hormone injections/genetic modification/etc will be rejected, even if all other aspects of this specification are being met. Abnormality will be arrived at by mutual consent, to be approved by station commander/medical officer. Good average size of fruits mentioned in Part III of this specification will be decided by the Executive Officer considering its purchase.

4. All mandatory requirements of FSSAI and other government bodies, as amended from time to time, pertaining to this specification, will be complied with.

**Variety**

5. **General.** The type and varieties of fruits fresh for consumption will be selected from those mentioned in this specification. Where specific varieties of a particular fruit fresh have been mentioned the same will be procured. The type (including varieties where applicable) and percentage of fruits fresh will be at the discretion of the Executive Officer in consultation with the local Medical Authorities, if necessary. The type/varieties of fruits fresh which are naturally available in a particular season will be selected as far as possible to derive maximum benefit of freshness and nutrition besides placing minimum reliance on cold storage fruits.

6. **Local Varieties.** Locally available fruits fresh and their varieties (other than those mentioned in this specification) may also be accepted, in case of troop's preference or nonavailability of varieties mentioned in this specification, after general market survey. Size and number of fruits fresh to a kilogram of those selected, will be fixed by the Executive Officer considering its purchase. Such fruits fresh should not exceed 10% of total annual requirement.

7. **Imported Varieties.** Varieties of imported fruits fresh already mentioned in this specification will be acceptable. Imported fruits fresh not mentioned in this specification may also be acceptable, provided troop's preference is there for the same. Survey will be necessary for its availability, acceptability, nutritional content, financial implications, etc. Size and number of fruits fresh to a kilogram of those selected, will be fixed by the Executive Officer considering its purchase. Such fruits fresh should not exceed 5% of total annual requirement.

### **Inspection**

8. **General.** Fruits fresh will be subjected to inspection by local Supply Officer, as per parameters mentioned in this specification and contract clauses therein. After careful inspection and having found fruits fresh conforming to this specification, the same will be accepted. All fruits fresh will be supplied in suitable size containers (CFB, CFC, plastic crates, wooden boxes, baskets, paper boxes, etc other than bags), designed to protect the fruits fresh from transportation related damages and deterioration. These containers will be clean and dry, without any previous remnants/marks/contaminants, before placing the fruits fresh. Additional cushioning to protect individual fruits fresh may be provided if so reqd, by use of paper, grass, leaves, soft plastic shreds, etc. Stickers individually affixed on fruits fresh when removed, should not leave visible traces of glue nor lead to skin defects. Fruits fresh viz; Grapes, Cherry, Plums, Apricot, Peach and Strawberry will be issued in small size packs only, these will not be emptied for inspection, the inspection will be carried out after opening of upper flaps only, where a detailed check is necessary adequate number of packs may be emptied.

9. **Use of Chemicals.** No chemicals will be administered to the fruits fresh internally or externally to enhance size, colour, taste, ripening, shine, etc. Fruits fresh will not be dipped in water. Preservatives where used must be permitted ones as per FSSAI guidelines and must be within the permissible limits. Residual level of heavy metals, insecticide, pesticides, fungicides and others, for food safety requirements will be complied with as per guidelines of FSSAI or other related Government bodies.

### **Tolerance**

10. **Seasonal Tolerance.** To account for specific regional effects or adverse seasonal impacts on the quality or early/ late seasonal variance or early/ late availability, the same may be approved by the Executive Officer considering its purchase, after ascertaining the facts and communicated in writing to all concerned.

11. **Minor Tolerance.** Without any effect on the nutritional character and palatability of fruits fresh a combined tolerance limit of upto 5% for minor tolerances on surface area, as well as number of fruits fresh, laid down in this specification will be acceptable to accommodate seasonal/crop variations, being an agricultural product.

12. **Weight/Number Tolerance.** Within a particular variety all individual fruits fresh should weigh/number 10% (+/-) of the average weight/number of the fruits fresh. Average weight/number may be obtained by measuring a fair quality of the particular variety of the fruits fresh.

13. **Major Defects.** Fruits fresh showing any major defects as mentioned in this specification will be rejected.

14. Region wise availability including early or late ripening due to natural climatic conditions may be suitably incorporated by the Executive Officer in the schedule. Fruits fresh will be of the same variety, quality, size, and degree of ripeness in one offering. Two or more varieties of a particular fruits fresh will not be mixed during the offerings. Acceptable tolerance will be applicable to all fruits fresh including local varieties.

**PART-II : QUALITY PARAMETERS AND DESCRIPTION****GROUP I – MAJOR FRUITS**

**(Total quantity of this group will not be less than 60% of annual requirement) Apple (Hindi name – Seb, Botanical name – Malus Domestica)**

1. **Fruit Characteristics.** Apple will be fine grained, sweet, juicy, mature and good smelling. It will be of normal bloom, glossy smooth skin, stem intact (if removed brake should be clean). Colour of apple will be characteristics of the variety, which generally ranges from creamy white, light green, golden, pink to red with small dots scattered all over. It will be of even size, shape and weight for each variety. It is generally available from August to February.

2. **Major Defects.** It will not have any sign of internal blackening/rotting or degradation of pulp. It will not be distorted or irregular in shape, sour in taste.

3. **Minor Tolerances.** Minor skin blemishes, healed injury on skin (nail, rub marks), minor superficial bruises, natural marks, slightly defect in colour, skin, shape, development, etc not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.**

(a) **Red Delicious.** Fruit is large-sized, oblong-conical in shape, greenish-yellow in colour with red streaks. Flesh is creamy, juicy, aromatic and sweet in taste.

(b) **Starking Delicious.** Fruit colour is greenish-yellow, covered with dark red stripes all over the fruit. Flesh is creamy, juicy, aromatic, sweet in taste with excellent quality.

(c) **Ambri.** Indigenous variety of attractive apple with extra-ordinary keeping quality. Fruit is medium to large in size and oblong in shape. It has red streaks over a greenish-yellow colour background. The pulp is white, crisp and sweet.

(d) **Golden Delicious.** Fruit is medium in size, round - conical to oblong in shape. Fruit colour is greenish yellow which turns to golden-yellow on ripening. Some fruits are half flushed with pale orange. Flesh is creamy, crisp, fine textured, juicy, sweet, little acidic with good aromatic flavour.

(e) **Red Chief.** Fruit size is medium to large, conical in shape, dark in colour and stripes are present on blush. Fruit is uniformly coloured. Flesh is creamy yellow, firm, juicy, aromatic and sweet in taste.

(f) **Red Spur.** Fruit size is medium to large, conical in shape. Fruit is dark red in colour. Flesh is creamy-yellow, firm, juicy and sweet in taste.

(g) **Imported varieties.** Fuji, Honey Crisp, Gala, Braeburn.

(h) **Other Important Varieties.** Red Gold, Macintosh, Sunhari, Khuru, American.

**Banana (Hindi name - Kela, Botanical name - Musa Sapientum)**

1. **Fruit Characteristics.** Banana will be sweet, aromatic, firm (not soft) with starchy flesh and no foreign smell or taste. It will have normal bright bloom with colour generally ranging from green, yellow to orange. It will be slightly arched to a smooth curvature. Its butt end intact and neck end attached to a bunch. The size of Banana (measurement is over the curvature, across the back) will vary according to variety in the range of 100 - 250 mm. It will be offered in bunches and not in complete cluster (having large number of bunches together). Minimum 95% Bananas will be in bunches. It will be totally free from seeds. It is generally available round the year.

2. **Major Defects.** It will be free of cuts (through the peel into the pulp), hard lumps, excessive scattered brown spots/ flecks. It will be free from heat injury (pilling, blackening of skin), chill injury (dull greyish or blackened peel or brown under peel discoloration), freeze injury (dark water soaked areas).

3. **Minor Tolerances.** Insect damage (dry brown scab), bird/nail damage (scars), physiological disorder (reddish brown discoloration), superficial skin bruises, abrasion, rub damage, etc not affecting quality of fruit may be accepted, if within acceptable limits.

## 4. Recommended Varieties.

- (a) **Dwarf Cavendish.** Leading variety of Banana. Fruit is large, curved, skin thick and greenish, flesh soft and sweet. The greenish colour of the fruit is retained to some extent even after ripening, but fruits ripening during the winter season develop yellow colour. Average bunch weighs about 20 kg.
- (b) **Harichal.** Fruit is large, skin thick, greenish to dull yellow, sweet and delicious. Average bunch weighs about 20 kg.
- (c) **Nendrun.** Fruit is relatively longer and thicker than most other bananas. The bunch is not compact. Average bunch weighs about 15 kg.
- (d) **SafedVelchi.** This variety is under stray cultivation, the fruit is medium size, firm flesh and sweet. Average bunch weighs about 15 kg.
- (e) **Poovan.** Fruit is medium to small in size, yellow skinned, firm flesh with a subacid taste. It has good keeping quality. Average bunch weighs about 15 kg.
- (f) **Martman.** Fruit is medium size, similar to Poovan in appearance. Skin is thin, ivory yellow in colour, flesh firm, sweet with a pleasant aroma. Average bunch weighs about 12 kg.
- (g) **Champa:** The bunch is cylindrical with closely packed short, stout and bottle necked fruit. At maturity, the fruits are dark green and turn to golden Yellow on ripening. Pulp is Yellowish, juicy soft, tastes a blend of sweet and acidic and a unique flavour. Size of fruit/finger varies from 12 to 14 cm in length and 3 to 4 cm in diameter. Each fruit weighs 65 to 75 gm. 12 to 14 fruits/fingers constitute one Kg.
- (h) **Other Important Varieties.** Robusta, Chinia, Basrai, Virupakshi, Lal Banana.

**Mango ( Hindi name- Aam, Botanical name –MangiferaIndica)**

- Fruit Characteristics.** Mango will be mature, ripe, firm, juicy, yield slightly to finger pressure, smooth thin skin, sweet, pleasant aroma. The colour generally ranges from light green to yellow (lemon/golden) to orange as per variety. The shape generally ranges from oval, heart shape to oblong shape. It will ripe on trees or under normal storage conditions. It will have good pulp recovery. It is generally available from March to August.
- Major Defects.** It will be free from temperature injury (scattered small dark- brown spotting on dull discoloured skin), physiological injury with internal breakdown (watery, translucent or spongy) and scalding due to temperature injuries. It will not be fibrous, sour, sweet-sour in taste.
- Minor Tolerances.** Light/dark blemishes in small spots, sunburn injury (bleaching) in small patches, marks of tree latex, etc not affecting quality of fruit may be accepted, if within acceptable limits.
- Recommended Varieties.**
  - Safeda.** Fruit has attractive apricot yellow peel, medium to large in size with good pulp recovery. The taste and flavour are excellent.
  - Ratna (Neelum x Alphonso).** Fruit is medium to large size, deep yellow colour, pulp recovery is very good, pulp is orange in colour. Fruit is free from spongy tissues. The fruit taste is sweet.
  - Kesar.** Fruit is rated second to Alphonso in terms of quality. Fruit is medium to large size, very good taste and sugar acid blend is excellent.
  - Dahsehari.** Fruit is primrose to canary yellow with abundant light yellow dots, medium size with smooth skin. The flesh is yellow, firm, with almost no fibre and a delightful aroma and very sweet taste. Stone is thin.
  - Langra.** Fruit is greenish yellow with medium to big dark green dots, ovalish-oblong in shape and medium size. The flesh is firm to soft, fibreless, lemon yellow, very sweet with strong pleasant aroma, juice moderately abundant.
  - Chausa.** Fruit is canary yellow to raw sienna when fully ripe with numerous obscure medium size dots with minute specks inside them. The skin is thin and somewhat adhering to pulp. Pulp soft and juicy with scanty fine, long fibre near the stone. The fruit is very sweet with luscious, delightful aroma and excellent quality.



(g) **Banganpalli**. Fruit is primrose-yellow, large size, obliquely oval, skin smooth, thin and shiny. The flesh is firm with juice moderate to abundant and without fibre. Very tasty and delightful.

(h) **Bombay Green**. Fruit is medium size, has strong and pleasant flavour. Pulp is soft and sweet.

(j) **Himsagar**. Fruit is medium size, having good quality. Flesh is firm, yellow, and fibreless with pleasant flavour. (k) **Alphanso**. Fruit is very popular, medium size, ovate - oblique in shape, orange yellow in colour, has attractive blush towards the basal end. Pulp is firm, fibreless with excellent orange colour.

(l) **Neelum**. Fruit is medium size with good flavour, soft flesh yellow in colour and fibreless.

(m) **Raspuri**. Fruit is medium size, dark green in colour, flesh is yellow, pulp is soft and very juicy with long fibres, very sweet to taste.

(n) **Sindura**. Fruit is medium size, upper part as red and lower part as green. Flesh is firm, juicy, yellow, sweet with scant fibres.

(o) **Mallika**. Fruit is light green in colour, medium to large size with good pulp recovery. Very sweet to taste. Pulp is soft and fibreless, has delightful aroma.

(p) **Malgoba**. Fruit is large size, dark green in colour. Flesh light yellow in colour, firm, juicy and very sweet.

(q) **Fazli**. Fruit is large size, longish-oval shaped, green-yellow in colour, deep yellow pulp, sweet to taste. Orange ( Hindi name- Santra, Botanical name - Citrus Reticulate Deliciosa)

#### **Orange (Hindi name-Santra, Botanical Name- Citrus Reticulate Deliciosa)**

1. **Fruit Characteristics**. Orange will be mature, ripe, juicy, fresh, bright bloom, waxed look, firm, smooth skin (not more than 5 mm thick), sweet, low acid flavour. Uniform colour is generally from light to full orange with red blush, dark red or burgundy flesh, yield to slight pressure, round to oval in shape. It has very high juice content. Minimum juice extraction will be 35% for all varieties. It is generally available from July to March.

2. **Major Defects**. It will be free of dark lesions on the fruit skin, black decay of fruit core, frost damage. No temperature injury (water soaked flesh or dark brown depressed lesions) or sunburn (pale, hard skin). Green coloured, bitter, foul, bland taste and smell are not permitted. The wedges should be intact, without leakage, no bitter/foul/bland taste and smell.

3. **Minor Tolerances**. Superficial black/grey marks, enlarged navels, stem corrugations, light/ dark blemishes over small area, sun bleached yellow orange areas, slight defects in shape, colour, skin, russets, etc, not affecting quality of fruit may be accepted, if within acceptable limits. Light green area not more than 20 % or 30 % of surface is permitted during late seasoning, over and above the minor tolerances limit.

#### **4. Recommended Varieties.**

(a) **Nagpur**. This variety occupies premier position and is one of the finest oranges in the world. Fruit size is medium to large, smooth surface, glossy, rind thin, soft, loose segments and rind, with 10-12 segments, excellent quality.

(b) **Hamlin**. Fruit size is medium, deep greenish yellow colour changing to orangered with full maturity, apex rounded and very slightly scarred, base smooth and rounded, rind very smooth bright thin, having 11-12 segments, flesh deep orangeyellow, juice abundant, acidity and sugars well blended, flavour excellent.

(c) **Jaffa**. Fruit size is medium to large, colour orange-yellow to orange red, globose to ellipsoid, apex rounded, base rounded, rind smooth, finely pitted, 9-12 segments, flesh yellow, fine grained, pulp melting, acidity and sweetness normal and well blended.

(d) **Malta Blood Red**. Fruit size is medium to large, round or slightly long, cadmium-yellow rind usually thin, tight and glossy, pulp streaked red early in season and full red when ripe, fine grained, melting, sweet, acidity well blended, juice abundant.

(e) **Sathgudi**. Fruit almost spherical, small to large, smooth surface, attractively orange coloured when fully mature, base and apex evenly rounded, rind thin, semiglossy and finely pitted. Pulp uniformly straw coloured, juicy, flavour excellent, 10-12 segments.

(f) **Valencia Late.** Fruit is medium to large, round or slightly oval, deep golden orange, apex rounded, slightly flattened, scarred, base smooth, rounded, rind thin, smooth, tough, pulp orange coloured, juice abundant, melting, acidity and sweetness well blended, excellent flavour and quality. Guava (Hindi name- Amrood, Botanical name - PsidiumGuajava)

#### **Guava (Hindi Name- Amrood, Botanical Name PsidiumGuajava)**

1. **Fruit Characteristics.** Guava will be thin skin, smooth/ bumpy surface, firm, ripe, sweet, mature, with good aroma. It will have thick pulp with seeds, which becomes softer towards the centre. It is generally round, oval, pear shaped as per the variety. Its colour is generally green, pale green to yellow. The pulp will be white, yellow, pink, salmon or red as per the variety. It must not yield to fair pressure. It will have typical fragrance and will be tree ripe. It is generally available from September to April.

2. **Major Defects.** It should not be acidic in taste, over ripe, under ripe, fibrous, hard to bite or chew, gummy, astringent, foul smell/ taste.

3. **Minor Tolerances.** Superficial marks, bruises, blemishes, fairly hard seeds, etc not affecting quality of fruit may be accepted, if within acceptable limits.

#### 4. **Recommended Varieties.**

(a) **Allahabad Safeda.** Fruit is large, round, smooth skin, seeds numerous, bold and hard, yellow white in colour. Flesh white, firm and soft.

(b) **Lucknow-49.** Also called as Sardar. Fruit is large, roundish/ orate shape, skin- prim rose yellow in colour, pulp white, very sweet and tasty.

(c) **Allahabad Surkha.** Fruit is large, uniform pink skin, deep pink flesh, sweet, strong flavour with few seeds.

(d) **Chittidar.** Fruit is large, round, smooth skin, yellow white in colour. Flesh white, firm and soft. It will have numerous red dots on skin, high sweetness, small/soft seeds.

(e) **Other Important Varieties.** Nagpur seed less, Bangalore, Dharwar, AkaraMridula.

### **GROUP II - MINOR FRUITS**

#### **Pear (Hindi name - Nashpati, Botanical name- PyrusCommunis)**

1. **Fruit Characteristics.** Pear will be firm, sweet, juicy, crunchy, skin intact, evenly sized, sweet smelling with a dull bloom, stem intact and no foreign matter, with uniform rough skin and typical long pear shape with elongated, tapering neck. It is generally yellow green to dark green in colour. It is generally available from September to February.

2. **Major Defects.** It will be free of sun burns, heat damage, rots, etc. It will not have protruding areas, irregular curvatures or sutures, no internal breakdown or internal bruises.

3. **Minor Tolerances.** Skin marks/blemishes, etc not affecting quality of fruit may be accepted, if within acceptable limits.

#### 4. **Recommended Varieties.**

(a) **Nashpati.** Firm, crunchy, sweet, granular, green colour, medium size.

(b) **Pears Kashmiri.** Juicy, firm, sweet, light green colour, large size, soft flesh.

(c) **BaguGosha (Bartlett).** Very juicy, easy to bite, melting in mouth, sweet, light colour, large size, excellent food quality.

(d) **Pears William.** Juicy, sweet, large size, green colour.

(e) **Pears Stone.** Firm, juicy, sweet, medium size, green colour.

#### **Grapes(Hindi name - Angoor, Botanical name- VitisVinifera)**

1. **Fruit Characteristics.** Grapes will be full bodied, bright, practically intact bloom, sweet, firm, crispy skin, juicy, seedless, distinctive flavour, aromatic, colour generally ranges from black to blue to green

(light/dark light). Shape is generally round, oval or elongated. Up to 90% of berries must be attached to the bunch. It is generally available from January to June, some varieties are also available from November to December.

2. **Major Defects.** It will be free of pests, rotten skin, skin damages, spray deposits, water berries, etc. Detached berries from bunches will be well healed and not deteriorated.

3. **Minor Tolerances.** Differences in shape, small berries, uneven ripening/colour, bruising, sun scorching, etc not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.**

(a) **Thomson Seedless (and its mutants).** It is sweet-tart, crunchy, oval-oblong shape, white in colour and seedless.

(b) **Sharad Seedless.** It is elongated, cylindrical, black/amber colour. Berries firmly attached to stalk, evenly spaced, intact bloom.

(c) **Perlette.** White in colour, sweet, juicy, seedless variety.

(d) **Flame Seedless.** Red in colour, sweet-tart, crunchy.

(e) **Other Important Varieties.** Sonaka, Pusa Seedless, Beauty Seedless.

**Musk Melon (Hindi name- Kharbooja, Botanical name- CucumisMelo).**

1. **Fruit Characteristics.** Musk Melon will be firm, sweet, smooth, juicy, melting flesh, highly aromatic like Musk. Generally uniform light-green to yellow-green to yellow skin colour, with light brown netting, at times separated by narrow (2-3mm) dark green subsurface band. Slightly raised delicate netting over surface of the fruit. Small sound seed cavity with slightly soft edges. Uniformly round to slightly oval in shape. It is generally available from February to July.

2. **Major Defects.** It will be free of sun burns, heat damage, etc. It will not have protruding areas, internal breakdown or bruises. It will be free from foreign or 'off' tastes or odours. It will not be deformed or have sutures.

3. **Minor Tolerances.** Physical damages, skin marks/blemishes, soil matter attached to fruits, etc not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.** All varieties of smooth or netted skin are permitted. The following are however recommended.

(a) Honey Dew.

(b) Crenshaw.

(c) Casaba.

(d) Galia.

(e) Cantaloupe.

(f) Santa Clause.

**Papaya (Hindi name - Papita, Botanical name - Carica Papaya)**

1. **Fruit Characteristics.** Papaya will be firm, full bodied, fresh, smooth, melting flesh, sweet, juicy, thin and slightly waxed skin, less number of seeds, free from foreign smell or taste. It is generally oval, elongated to slightly pear shaped, larger fruits are generally five sided. Generally greenish yellow to yellow, pink, red coloured flesh. Small green/brown skin spots over the surface. Skin smooth with moderate gloss. It is generally available round the year.

2. **Major Defects.** It will be free from rots, scars, wounds, scratches, and frost damage.

3. **Minor Tolerances.** Leak of latex, surface debris, etc not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.** All varieties are permitted. The following are however recommended.

(a) Coorg Honey Dew.

(b) Pusa Dwarf.

(c) Pusa Majesty.

(d) Pusa Delicious.

- (e) Honey Dew.
- (f) Ranchi Selection.
- (g) Washington.

**Sweet Orange (Hindi name – Mosambi, Botanical name - Citrus Sinensis)**

1. **Fruit Characteristics.** Sweet Orange will be large, firm, juicy, sweet citrus fruit. It is generally dark green to light green / pale green in colour and round/ oval in shape. It shall have characteristic aroma and taste. It shall have comparatively tight rinds, wedges tightly packed and difficult to remove. Minimum juice extraction will be 35% for all varieties. It is generally available from July to March.
2. **Major Defects.** It will be free of lesions on fruit skin, decay of fruit core. No frost damage, temperature injury (water soaked flesh or dark brown depressed lesions) or sunburn (pale, hard skin). Bland taste and smell are not permitted.
3. **Minor Tolerances.** Superficial black/grey marks, enlarged navels, stem corrugations, slight defects in colour, shape, skin, hail damage, handling damage, sun bleached areas, etc, not affecting quality of fruit may be accepted, if within acceptable limits. Light green area not more than 20- 30 % of surface is permitted during late seasoning, over and above the minor tolerances limit.
4. **Recommended Varieties.** All varieties are permitted.

**Pine Apple (Hindi name - Ananas, Botanical name –AnanasComosus)**

1. **Fruit Characteristics.** Pine Apple will be sweet, firm, juicy, strong sweet aroma and taste, texture not chalky or fibrous. It will have thick, rough skin covered with hexagonal pattern of nodules. It will have thick blue-green bunch of Cactus like leaves at top with tough central core. Colour of skin is generally greenish yellow to golden yellow. Shape is generally cylindrical to pine cone. On slicing should have minimum development of translucent area. Stem and crown be trimmed to 2 cm to 10 cm respectively. It is generally available from May to September (maximum), July, December to March (minimum).
2. **Major Defects.** It should be free from diseases, insipid/cracky taste, mechanical damages, black rot, watery spots, low temp injuries and decay.
3. **Minor Tolerances.** Minor shrivelling, discoloration, non-uniform ripening, stains, surface mud debris, wounds, scratches, punctures, etc, not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-
  - (a) Giant kew.
  - (b) Queen.
  - (c) Kew.
  - (d) Mauritius.

**GROUP III - MICRO GROUP**

**Sapodilla (Hindi name - Chickoo/Sapota, Botanical name – AchrasSapata)**

1. **Fruit Characteristics.** Sapodilla will be medium to large, exceptionally sweet, malty caramel flavour, smooth skin with sandy brown scruff, resembling a smooth skimmed Potato. It is generally round, oval, ellipsoidal, oblate shaped with pointed ends. Colour of flesh ranges from pale yellow to earthy brown with a grainy texture. Difficult to peel, yields to pressure. It is generally available from December to March.
2. **Major Defects.** It should be free of rawness, rots, internal breakdown, over ripening, watery spots, low temp injuries and decay.
3. **Minor Tolerances.** Superficial skin damages, discolouration, change in colour, wounds, scratches, punctures, etc, not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-
  - (a) Kalipatti.
  - (b) Cricket Ball.
  - (c) Pala.
  - (d) Kirtibarthi.
  - (e) Bhuripatti.

**Kinnow( Hindi name- Kinnow, Botanical name - Hybrid of Citrus Nobilis and Citrus Delicosa)**

1. **Fruits Characteristics.** Kinnow will be medium to large, golden orange colour, easy to peel, sweet, refreshing, oblate, base flat, juicy, more seeds per segment, 9-10 segments per fruit, comparatively loose rind, citrus fruit. It is generally available from December to February. Minimum juice extraction will be 40% for all varieties.
2. **Major Defects.** It will be free of lesions on fruit skin, decay of fruit core. No temperature injury (water soaked flesh or dark brown depressed lesions) or sunburn (pale, hard skin). Bland taste and smell are not permitted.
3. **Minor Tolerances.** Superficial black/grey marks, enlarged navels, stem corrugations, light/ dark blemishes over small area, sun bleached areas, slight defects in shape, colour, skin, russets, etc not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted.

**Pomegranate (Hindi name- Anaar, Botanical name –PunicaGranatium).**

1. **Fruit Characteristics.** Pomegranate will be plump, unblemished, rounded, shiny, feel heavy for size, firm to touch, make metallic sound when tapped, thick tough leathery skin, generally has yellow colour over laid on deep pink to rich red colour. It generally has 7001400 arils, red, pink, white, purple in colour. Seeds surrounded by water laden pulp. Seeds are also in a white, spongy pulp, internal strip white membrane. It has tangy, sweet-sour flavour (sour due to acid tannin). It is generally available from July to September and September to February.
2. **Major Defects.** It will be free from wrinkles, dull/pale skin, cuts, bruises, shiny, tangy. No internal decay.
3. **Minor Tolerances.** Superficial skin damages, discolouration, change in colour, wounds, scratches, punctures, etc, not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-

- (a) Ganesh.
- (b) PhuleArakta.
- (c) Mridula.

**Apricot (Hindi name – Khurmani, Botanical name – PrunusArmeniaca)**

1. **Fruit Characteristics.** Apricot will be smooth surfaced or have very short hair. It is generally oblong or round in shape. Firm but give way to palm pressure. Sweet smelling generally yellow to orange in colour (red on sides exposed to sun). It has a prominent wedge and is fairly dry. Its kernel may be sweet or bitter. It is generally available from May to June.
2. **Major Defects.** It will be free of fruit fly, frost damage, brown spots, musty feeling and presence of sulphur.
3. **Minor Tolerances.** Superficial skin damages, discolouration, change in colour, wounds, scratches, punctures, etc, not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-

- (a) New Castle.
- (b) Kaishe.
- (c) Moorpark.
- (d) Turkey.
- (e) Halman.
- (f) Bati.

**Cherry (Hindi name – Cherry, Botanical name –PrunusAvium)**

1. **Fruit Characteristics.** Cherry will be fleshy, smooth surfaced, round to oblong to cylindrical in shape, light pink to dark red in colour, firm, sweet, juicy, stone fruit, produced in bunches, offered with stems. It is generally available from April to June.

2. **Major Defects.** It will be free of pit damage due to frost, over ripening, internal decay, surface deteriorations.
3. **Minor Tolerances.** Scab, hail, discolouration, scar tissues, etc not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted.

**Peach (Hindi name- Adoo, Botanical name-PrunusPersica )**

1. **Fruit Characteristics.** Peach will be sweet, juicy, firm, not dry and woody, free of foreign smells and taints, stone fruit. Flat irregular surface donut shape with thin skin, no foreign matter. Creamy pink to red blush covering 20-80% of surface, background skin is creamy green, internal flesh is creamy white. It is generally available from May to July.
2. **Major Defects.** It will be free from sun scalding, splitting, gumming, brown rot, spots, cracks, bruises.
3. **Minor Tolerances.** Scab, hail, discolouration, green tinge, scar tissues, etc, not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted. The following are however recommended.

- (a) Red heaven.
- (b) Sun heaven.
- (c) Alton.
- (d) July Elberta.
- (e) Peshwar.
- (f) Prabhati.
- (g) Pratap.

**Plum (Hindi name - Aloo Bukhara, Botanical name –PrunusSalicina)**

1. **Fruit Characteristics.** Plum will be sweet and tart, in a variety of shapes, sizes, colours. It yields under pressure, ripe at room temperature, yellow red flesh, seed difficult to separate, clings to flesh, stone fruit. It is generally available from April to June.
2. **Major Defects.** It should be free from decay, breakdown (soft mushy condition), freeze injury (water soaked, glazed areas), soft, over ripe, shrivelled. No drought spot, sun scald, nail damage, leaf/limb rub mark, hail damage.
3. **Minor Tolerances.** Condition defect after packing, superficial damages, crushing, freezing, overheating, etc, not affecting quality of fruit may be accepted, if within acceptable limits.
4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-

- (a) Salicina group (Japanese).
- (b) Satluj.
- (c) Kala.
- (d) Amritsar.
- (e) Titron

**Litchi (Hindi name - Leechi, Botanical name - Litchi Chinensis)**

1. **Fruit Characteristics.** Litchi will be firm, pump, full bodied, sweet, juicy white flesh with a consistency similar to a grape, not tart or acidic, distinct aroma, flesh separates cleanly and easily from skin, smooth dark brown small size seed, free from foreign and offensive smell or taste. Its leathery skin is covered with small bumps, free from foreign matter. It is generally heart/ oval shaped, green to red in colour, greening not more than 40% of visible surface area. Offered with a stub of stem, in bunch. It is generally available from May to June.
2. **Major Defects.** It will be free from pericarp browning, pests, softening of aril, blunt taste, rots, bacterial, yeast, fungal, decay.

3. **Minor Tolerances.** Superficial skin damages, discolouration, wounds, scratches, punctures, etc, not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-

- (a) Shahi.
- (b) China.
- (c) Dehradun.
- (d) Rose scented.
- (e) Purni.
- (f) Kasba.
- (g) Bombay Green.

**Water Melon (Hindi name – Tarbooja, Botanical name – CitrullusLanatus)**

1. **Fruit Characteristics.** Water Melon will be juicy, have thick rind, fleshy centre, smooth exterior (colour is generally green, yellow, white), sweet interior (colour pink, orange, yellow, red (not over ripe). It is generally round, oblong, tubular in shape. Will have light green, dark green, mixed green, stripes in the exterior. It is generally available from January to March (North India), September to October (South India).

2. **Major Defects.** It will be free of sun burns, heat damage. It will not have protruding areas, internal breakdown or bruises. It will be free from foreign or 'off' tastes or odours. It will not be deformed or have sutures.

3. **Minor Tolerances.** Physical damages, skin marks/blemishes, soil matter attached to fruits, etc, not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-

- (a) ArkaJyoti.
- (b) ArkaManik.
- (c) Asahi Yamato.
- (d) Durgapur Kesar.
- (e) Madhu, Milan, Mohini.
- (f) Sugar baby.

**Custard Apple (Hindi name - Sitafal, Botanical name- AnnonaSquamos)**

1. **Fruit Characteristics.** Custard Apple will be sweet, rich flavoured, pleasant, slightly granular, bit slippery, with a thick creamy white layer of custard like granular flesh beneath the skin, having moderately juicy segments. Many segments may have a seed. It is irregular, round, heart shaped, lop sided shaped deep or shallow depression at base. It is generally green-brown to light green to yellowish in colour with red highlights, varying degree of reticulations. Skin is dull, thin but tough covered in irregular smooth bumps or prominent nodules as per variety. It is generally available from August to October (North India) and September to November (South India).

2. **Major Defects.** It will be free from rots, internal breakdown, skin splitting, over ripening, press marks, water soaking.

3. **Minor Tolerances.** Superficial skin damages/bruising, discolouration, change in colour, wounds, scratches, punctures, etc, not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.** All varieties are permitted. The following green coloured (various shades) varieties are however recommended:-

- (a) Balanger.
- (b) Local sitafal.
- (c) Saharanpur local.
- (d) Washington.

**Strawberry (Hindi name - Strawberry, Botanical name – Fragaria Vesca)**

1. **Fruit Characteristics.** Strawberry will be sweet, juicy, aromatic, bright natural shine, reddish-pinkish colour conical shape. Calyx (cap) of fresh green colour shall be intact on the fruit. It yields under pressure, has many tiny seeds on the outside. It is generally available from February to April (in plains) and May to June (in hills).

2. **Major Defects.** It should be free from fungus, moulds, acidic taste, decay, breakdown (soft mushy condition), water soaked, soft, over ripe and shrivelled.

3. **Minor Tolerances.** Condition defect after packing, superficial damages, crushing, misshapen, white/poorly coloured, swollen, less firm, irregular surfaced, etc not affecting quality of fruit may be accepted, if within acceptable limits.

4. **Recommended Varieties.** All varieties are permitted. The following are however recommended:-

- (a) Dilpasand.
- (b) Bangalore.
- (c) Solana.
- (d) Royal Sovereign.
- (e) Tioga.
- (f) Torrey.

**PART- III APPROVED VARIETIES OF FRUITS FRESH AND THEIR QUALITATIVE ASSESSMENT**

All fruits fresh for the purpose of assessment shall be graded for size and grade which shall constitute the crux of the assessment. Maximum possible number of fruits to a kilogram are laid down below as part of this specification:-

S No	Fruit	Variety	No of fruits per Kg
1	Apple	Delicious	5-7
		Other varieties	6-8
2	Banana	Length not less than 14 cm and width not less than 2.7 cm	
3	Mango	Deshaeri	5-7
		Other varieties	4-6
4	Orange	All Varieties	6-7
5	Guava	-do-	6-8
6	Pear	-do-	6-8
7	Grape	-do-	Bunch weight of 150/100 gm for large/small berries respectively
8	Musk Melon	-do-	1-2
9	Papaya	-do-	1-2
10	Sweet Orange	-do-	5-7
11	Pine Apple	-do-	1-2
12	Sapodilla	-do-	8-10
13	Kinnow	-do-	5-7
14	Pomegranate	-do-	4-6

**Note** - Other seasonal locally available fruits may be included at the discretion of the local commanders and temporary specification may be prepared by the station.



**SECRETARIAT OF THE TECHNICAL STANDARDISATION COMMITTEE (FOOD STUFFS) (DIRECTORATE GENERAL OF SUPPLIES AND TRANSPORT)**

**DEFENCE FOOD SPECIFICATIONS-2020**

**SPECIFICATION NO 363 : POTATO FRESH**

**General**

1. The potato is the modified stem form of *Solanumtuberosum* which has abundantly grown varieties available in various parts of the country viz Gola, Phulwa, Surkha, Imported Form, Up-To-Date (Disease-free clone), Darjeeling Red Round, Craig's Defiance, Great Scot, President, Kufri (Red, Kuber, Kisan, Kundan, Safed, Kumar, Neela) and newly improvised varieties of Kufri (Sindhuri, Chandramukhi, Khasi-Gare, Chamatkar, Neelamani, Sheetman, Jyoti, Alankar, Lauvkar, Dewa, Badshah, Bahar, Sherpa, Himalini, Lalima, Muthu). These varieties of potatoes grow during various seasons and different parts of the country.
2. Crop Seasons the potatoes are grown in two seasons and these are called as the summer crop and winter crop.
  - (a) The summer crop (or rainy season crop) is planted during April-June and is ready by July and continues upto September.
  - (b) The winter (or besike) Crop is planted during October-December and is ready by February-March.

**Quality**

3. The potato fresh shall be the one from the crop in season and freshly dug. These shall be of similar varietal characteristics, washed well and graded uniformly for size for individual supplies. Fresh potatoes shall be of average size so that they should not pass through a circular sieve having aperture 5 Cm x 5 Cm and should not retain on a circular sieve having aperture 10 Cm x 10 Cm. The fresh potato shall be sound, wholesome and of a proper stage of maturity, with round (flat) or pebble round (spherical), pear shaped, long oval, short oval, or oval shapes and must be free from malformed and spindle shape tubers. Fresh potato shall be in a pronounced state of rest, free from signs of sprouting, injury, cuts bruises, shrinkage, physiological disorder, insect damage, disease and any type of discolouration.
  - (a) The colour of fresh potato skin shall be russet, pale yellow, red, with netted or smooth eyes. These eyes shall also be free from discolouration.
  - (b) The colour of potato fresh shall be white or slightly pale yellow with mealy or firm texture and shall be totally free from discolouration of any type, rings, irregular patches or brittle flesh.
  - (c) Potatoes shall be free from soft wet cracking surface, watery, white to milky or cream coloured exudate and lesions. The lesions are deep pit extending upto 5 cm or more to the tuber flesh, hard and chalky, cheesy, leathery, bumpiness, necrosis around lenticles and growth cracks.
  - (d) Potatoes shall be washed well, cleaned, dried and freed from any contaminant, attached dirt/filth or any other material injurious to health.

4. Supplies ex Cold Storage the supplies of potatoes ex cold storage can be accepted during off seasons when fresh crop is not available in the market subject to the condition that the supplies shall conform to the quality requirements as laid down above in addition a strict norm shall be followed for the cut-off period for such supplies. A maximum period of twelve weeks of storage supplies could be accepted in extreme conditions. In no circumstances while the fresh potatoes are available in the market potato stocks ex cold storage shall be tendered/accepted. However in case where such supplies have to be accepted they shall be checked for the additional defects arising during storage in cold condition. Therefore such stocks shall be free from all above mentioned defects in addition shrinkage, light weightness of tubers, undesirable sweet taste, mahogany browning, stem and browning, greening, damages due to desiccation, holly heart, decay, bruising stringy, slimy and mucous discolouration or mucous discharge of tuber tissue/oozing from lentils. These shall be properly thawed and cleaned dried.

### **Inspection**

5. The potatoes fresh will be inspected for the prescribed quality and will be approved by the Supply Officer after his careful inspection and having found supplies conforming to this Specification. The potatoes fresh shall be supplied in suitable clean containers designed to protect the potatoes from damages, deterioration and contamination of any kind. These containers shall be washed well, disinfected and dried before packing potatoes.

**SECRETARIAT OF THE TECHNICAL STANDARDISATION COMMITTEE (FOOD STUFFS) (DIRECTORATE GENERAL OF SUPPLIES AND TRANSPORT)**

**DEFENCE FOOD SPECIFICATIONS-2020**

**SPECIFICATION NO 362 : ONION FRESH**

**General**

1. The onion fresh is the bulb of plant *Allium cepal* L and for the scope of this specification it is required to be dry cured and of the varieties grown in the country. Some of the varieties are as follows:-

- (a) **Yedugiri or Bellary**. The bulb of this onion is of flesh (buff) colour and has thickness ranging from 5 to 10 cm across at maturity, widely grown in Andhra Pradesh, Maharashtra, Karnataka and Gujarat.
- (b) **Dhulia**. The bulb dimensions are same as that of Bellary but colour of bulb is on light red to deep red side.
- (c) **Medium Varieties**. This is yet another variety widely grown in all regions of country. The colour of the bulb ranges from light rosy to pink colour but smaller in size ranging from 2 to 4 cm across. These varieties are strongly flavoured.
- (d) **White Variety**: The bulb of this onion is off white to rosy and of good size and thickness ranging from 5 to 10 cm across at maturity. These onions are low in flavour and pungency.
- (e) **Early Grano**. This variety has been introduced from USA and has large globular, yellow bulbs which are mildly pungent and are good for salads.
- (f) **Pusa Red**. This variety is medium sized red coloured onion and keeps well.
- (g) **PusaRatnar**. This variety is large sized, high yielding, red coloured onion and keeps well.
- (h) **PusaMadhavi**.
- (j) **Pusa white rounds and Pusa white flat**.
- (k) **Small sized onions**
  - (i) Some what elongated and
  - (ii) Globular and almost round.

These are basically pickling varieties or in recipes in which wholes are utilised. These varieties are of different colours ranging from white to purple, strongly flavoured and pungent.

2. **Crop Plantation Digging**. The crop takes 4 - 5 months from plantation and normally two crops are grown to take care of round the year requirements of onions. The first crop plantation is done during middle May to mid June and that of second during mid November to mid December.

## **Quality**

3. An appropriate variety in season from 1 (a) to (k) shall be approved and accepted for supply. The colour of onion shall be characteristic of its variety. The onion shall be mature, reasonably firm viz not tangibly soft or spongy. May have developed more than one distinct bulb joined only at base. Shapes like flattened globe, globe, high globe, spindle are normal shapes for onion. Onion bulbs shall be dry, well formed and give a rustling noise when handled. They shall be well cured with tough clinging skins and closed necks. Tops when present shall not exceed 2 cm in length and such onions shall not constitute more than 20% by weight of supply. Damaged onions are the onion bulbs, the appearance or the edible or marketing quality of which is materially affected by splitting, dry sunscald, sunburn, staining, sprouting, seed steams or mechanical injuries. Onion with these defects shall be rejected. Various types of damages of onions are indicated as under and onion fresh shall be free from all such defects:-

(a) **Splitting**. A split onion having more than one distinct bulb shall be considered as damaged when not completely covered by an outer scale and not well cured.

(b) **Dry Sunscald**. Softening of the tissues of not well cured onions due to exposure to the sun shall be considered as damage by sunscald. If dry and well cured, an onion shall be considered as damaged by sunscald when the injury is more than alight and is readily apparent without peeling it, except when affected area is dry and so inconspicuous that the appearance of onion is not materially injured.

(c) **Sunburn**. Is the discolouration of onions due to exposure to the sun where there is no injury to the tissue. Individual onions shall be considered damaged when this burn exceeds 25% of the total area.

(d) **Sprouting**. Onions are those which have visible sprouts.

(e) **Rooting**. Onion exhibiting development of fresh roots shall be considered as damaged.

(f) **Staining**. Onions showing discolouration caused by weathering or other causes seriously affecting the appearance and its natural smell shall be considered as damaged. Onions shall be free from black powdery material on the outer scales or in between the outer and first scale, also from small dark green to black dots that appear on the outer scales in the form of concentric rings or blotches.

(g) Onion shall be free from soft fleshy scales, if pressure on the bulb forces, a watery, foul smelling liquid, through the neck or on such pressure some of the scales slip off. And also grassy, water soaked, Pale-yellowish to light brown or yellow tissue often slimy with vinegar odour and soft spongy scales. They shall be totally free from signs of sweating or moisture condensation, dirt, dust filth or any other material not component of onion bulbs.

(h) **Size**. Onion supplies shall be of uniform and fairly well graded for size and the smallest size of onion shall not pass through a circular sieve having aperture 5 Cm x 5 Cm.

(j) **Taste and flavour**. The onion shall have the characteristic pungent taste and flavour of onion. The bulbs shall be free from any off taste, smell or odour.

4. **Supplies Ex Cold Storage.** The supplies of onion ex cold storage can be accepted during off season months when fresh crop is not available in the market subject to the condition that the supplies shall conform to the quality requirements as laid down in this specification. However, in all such cases while stored supplies are accepted they shall be carefully checked for the additional storage defects and rejected in case found to have suffered any such damage/storage damage.

### **Inspection**

5. The onion supplies shall be inspected for the prescribed quality and will be approved by the supply officer after his careful inspection and having found supplies conforming to this specification. The onion shall be supplied in suitable clean, dry containers designed to protect the onions from damages deterioration, sweating, decay and contamination of any kind. These containers shall be washed well, disinfected and dried before packing the supplies.

## **FOOD SPECIFICATIONS- BREAD (WHITE)**

### **Quality**

1. The bread shall be baked in conventional form in manufacturing plant which is preferably HACCP/ISO 22000 certified. The crust shall be free from blisters and shall be of a uniform golden to light brown colour. The crust shall not be burnt and shall be free from soot and any foreign matter.
2. The loaf shall have a volume/mass ratio of not less than 2.5. The crumb shall have small pores uniformly distributed, throughout and with thin cell walls. It shall be free from non-porous mass, splits and large holes, lumps of flour or salt or any other evidence of incomplete mixing or baking.
3. There shall be no hollow between the crust and the crumb.
4. The flavour shall be characteristic of fresh, well baked bread, free from bitterness or any other objectionable flavour or taste. The bread shall also be free from indications of rope or mould. Baking products received back from market shall not be recycled.

### **Packing**

5. The bread shall be wrapped or packed in sliced form either in clean waxed paper or any other suitable food grade wrapper to preserve freshness. Packing may also be done in printed food grade poly bags which can be tightened with rubber band. The mass of each bread loaf shall be either 400 gm or 800 gm as per the provisions of the Legal Metrology (packed Commodities) Acts 2009 and Rules 2011.

### **Marking**

6. The following particulars shall be clearly and indelibly marked on each pack of bread on the outer side of the wrapper. Printing shall be done by using non toxic and non penetrating/non transferable ink:-

- (a) Description of contents
- (b) Name and address of manufacturer
- (c) Trade name, if any
- (d) Mass of the loaf when packed
- (e) Any added ingredients such as preservatives, emulsifiers, dough conditioners nutrients etc.
- (f) Date of manufacture.
- (g) Best before
- (h) Symbol for veg food.

7. Essential Ingredients. The following material shall be used in the preparation of dough for white bread:-

(a) **Maida (Wheat Flour)**. Maida (Wheat Flour) shall be the product obtained by milling cleaned, hard or soft wheat or blends thereof in a roller flour mill and bolting. The flour shall be free flowing, dry to touch, should not pack when squeezed, should be creamy in colour and free from any visible bran particles. The flour shall have a characteristic taste and smell, and shall be free from insect and fungus infestation, rodent contamination, dirt and other extraneous matter. It should not have any musty flavour or rancid taste.

(b) The material shall also comply with the requirements given in Table 1 and 2 of BIS specification IS: 7464: 1988.

(c) **Leavening Agents.** Any of the following agents singly or in combination may be used:-

- (i) Baker's yeast (As per IS: 1320-1988 third revision).
- (ii) Barm and hops.
- (iii) Fermented juice obtained from palms, and
- (iv) Lactic acid ferment.

(d) **Edible common salt.** Edible common salt or iodized salt conforming to BIS specification No IS:253-1985 or IS: 7224-1985 shall be used.

(e) **Water.** Water used in the manufacture of bread shall conform to the quality tolerance limits laid down in BIS specification No 4251-1967.

8. **Optional Ingredients.** In addition to the essential ingredients prescribed above any of the following ingredients may be added in the dough :-

- (a) Milk and Milk products - (As per IS: 1166-1986 specification for condensed milk (second revision), IS : 1165-1992 specification for milk powder (Whole and skim) (fourth revision).
- (b) Vital gluten
- (c) Sugar and Sugar products.
- (d) Honey.
- (e) Liquid glucose (As per IS: 873-1974 specification for liquid glucose (first revision).
- (f) Dextrose monohydrate (As per IS: 874-1992 specification for dextrose monohydrate (third revision)
- (g) Malt products.
- (h) Other edible flours and starches.
- (j) Edible oil seed flour.
- (k) Fat - Hydrogenated edible vegetable oil or refined edible vegetable oil of suitable type, butter, ghee, margarine or their mixture.
- (l) Vitamins and/or minerals.
- (m) Lecithin
- (n) Albumin
- (o) Lysine
- (p) Fungal alpha amylase - not exceeding 100 mg/kg of the mass of the flour.
- (q) Sorbitol
- (r) Glycerine
- (s) Emulsifying agents - As per FSSAI rules.
- (t) Stabilizing agents -As per FSSAI rules.
- (u) Ammonium chloride - Not exceeding 500 mg/kg of the mass of the flour.
- (v) Ascorbic acid and
- (w) Lime water.

9. **Improvers.** Following improvers may be used:-

- (a) Ammonium - Not exceeding 2.5 gm/kg of mass per sulphate of the flour.
- (b) Calcium carbonate - Not exceeding 5 gm/kg of the mass of the flour.
- (c) Acid calcium - Not exceeding 10.0 gm/kg of the phosphate mass of the flour.
- (d) Calcium phosphate - Not exceeding 2.5 gm/kg of the mass of the flour.
- (e) L-cysteine - Not exceeding 90 mg/kg of the hydrochloride mass of the flour.
- (f) Guar gum - Not exceeding 5.0 gm/kg of the mass of the flour.

10. **Rope and Mould Inhibitors.** The following rope and mould inhibitors in the quantities given against each may be used :-

- (a) Calcium or Sodium propionate - Not exceeding 5.0 gm/kg of the flour.
- (b) Glacial acetic acid or lactic acid mass of the flour - Not exceeding 2.5 gm/kg of the
- (c) Vinegar - Equivalent to the concentration of acetic acid permitted.
- (d) Sodium diacetate - Not exceeding 4.0gm/kg of the mass of the flour.
- (e) Acid sodium pyrophosphate - Not exceeding 5.0 gm/kg of the mass of the flour.
- (f) Sorbic acid or its sodium, potassium or calcium salts. - Not exceeding 1.0 gm/kg of the mass of the flour.

11. **Dough Conditioners.** Calcium or sodium salt of stearyl-lactylate not exceeding 5.0 gm/kg of the mass of the flour.

### **Hygiene Requirements**

12. The bread shall be prepared in premises maintained in a hygienic condition, which shall be open to inspection at any time by a competent authority approved by the Quartermaster General and the Director General of Medical Services (Army).

13. The hygiene requirements in a factory producing white bread shall be in accordance with Appendix 'A' attached.

### **Inspection**

14. An inspection shall be carried out by the Director General of Supplies and Transport or an officer acting on his behalf on all supplies tendered for acceptance. The decision of this officer shall be final.

15. The bread shall conform to the following analysis:-

- (a) Total solid content, percent by mass, Min - 60
- (b) pH of the bread - 5.0 to 6.0
- (c) Acid insoluble ash (on dry basis), percent by mass, Max. - 0.1
- (d) Crude fibre (on dry basis), percent by mass, Max. - 0.5

### **Methods of analysis**

16. The methods of analysis shall be those as laid down in Bureau of Indian Standards Specification No IS: 1483-1988 for white bread.

### **Machinery**

17. A bread manufacturing unit shall preferably have the machinery in accordance with Appendix 'B' attached.



**Mandatory requirements of FSSAI/BIS**

18. All mandatory requirements of FSSAI/BIS, as amended from time to time, pertaining to the above product shall be complied with.

**Appendix 'A' to Specification  
for White Bread (Para 13 refers)****HYGIENE REQUIREMENTS**

1. Site. The bakery unit shall preferably be situated in an open, clean and healthy locality. The grounds of the premises surrounding the factory building should be clean and preferably paved or turfed to lay the dust.
2. Building
  - (a) Structure. The building shall be of permanent nature and shall be of brick and lime plaster, cement, concrete or any other material which ensures cleanliness. Construction of building shall be such that it shall be rodent proof, fly proof and bird proof. The building and yard, with fittings and equipment should be kept free from breeding places of flies and other insects by eliminating cracks and crevices, as well as by routine and thorough cleaning.
  - (b) Ventilation and lighting. The unit shall be adequately lighted and ventilated, keeping in mind the number of workers, their hours of work and nature of operation.
3. Floor. The floor shall be washable with sufficient drainage facility and it shall be impervious to water and not affected by weak acids, alkalies or steam.
4. Internal wall. The internal wall shall be smooth, it should be tiled or cement plastered or made of any other impervious material. Where wash basins, sinks are installed, the walls shall be tiled or made impervious to water upto the height of wash basin to safe guard the wall from water seepage.
5. Ceiling. The ceiling shall be kept clean.
6. Maintenance and repairs. The building shall be maintained in a proper state of repair and cleanliness. Whenever required it shall be lime washed, painted, disinfected and/or deodorized.
7. There shall be no cobwebs in any part of the unit.
8. Preparation and filling table shall be of wooden tops or covered with Aluminium or stainless sheets or otherwise made impervious to water as far as practicable. All surfaces coming into contact with the food shall be free from pits, crevices and loose scale and shall be non absorbent.
9. All internal joinery work should be of simple design for easy cleaning and for minimizing flour dust deposit. In all rooms' wood work, surrounding door windows and other opening should be fixed tight to the internal wall surface so as to avoid open joints which may harbour pests.
10. Store Rooms. The store rooms for raw and packing material should be free from dampness and should be rodent proof.
11. Wherever possible a separate room for storing machinery, equipment, spare parts shall be provided.
12. Proper place shall be provided for storage of brooms, brushes, buckets and other cleaning gear.

**13. Factory and processing Hygiene.**

- (a) Waste and rubbish shall be collected in covered receptacles and shall not be allowed to lie about on the floor.
- (b) Adequate measures shall be taken to prevent growth of mould on equipment and internal structure of processing and storage room.
- (c) Adequate measures shall be taken to prevent infestation of cockroaches and other house hold pests.
- (d) When pesticides and/or other disinfectants are used, care shall be exercised to prevent contamination of equipment, raw material and packing materials.
- (e) Floors and drains shall be kept clean. In the processing areas, the drains shall be provided with detachable covers.
- (f) Sinks and troughs used for washing ingredients and utensils shall not be used for washing of hands.
- (g) No lavatory, sink, cesspool or garbage shall be so situated or maintained that odours or fumes there from pervade any room where product or raw materials are prepared or stored.
- (h) The factory effluents shall be disposed of in a hygienic manner and shall not be let off on road or adjacent fields.
- (j) Window glass and light fitting shall be kept clean.
- (k) Domestic animals shall not be allowed in any part of the unit.

14. Container cleanliness. It shall be ensured that containers are clean. The containers shall not be stacked in a manner which allows the contamination of the product.

**15. Installation of Equipment**

- (a) All equipment shall be installed on a foundation of durable, easily cleanable material.
- (b) Equipment shall be placed away from the walls with a view to providing facilities for inspection and cleaning.
- (c) Installation of pipes shall be such as to facilitate easy cleaning and maintenance.

**16. Equipment and Container Cleanliness**

- (a) All electrical connections such as switch boxes, control boxes, conduit cables shall be installed in such a way as to facilitate proper cleaning.
- (b) All equipment coming in contact with raw materials or the product shall be kept clean. An ample supply of water, hoses, brushes, detergent and other equipment necessary for the proper cleaning of machinery and equipment shall be available.
- (c) All processing systems shall be cleaned at the close of operation or at the termination of the continuous operation period.

**17. Water.**

(a) There shall be adequate supply of potable water.

(b) The equipment shall be so installed and used that back siphonage of liquid into potable water lines is precluded.

(c) Hot and cold water in ample supply shall be provided for plant clean up needs where necessary.

(d) The storage tanks of water should, unless completely sealed, be kept covered, examined regularly and cleaned at least once every six months.

**18. Employee Hygiene**

(a) Every person employed in the factory shall be medically examined before employment. Periodical medical examination of the employee shall be subsequently carried out to ensure that they are free from contagious, communicable diseases.

(b) It shall be impressed upon all employees that they should notify the medical officer, cases of vomiting, diarrhoea, typhoid, dysentery or any other notifiable disease occurring in their own homes and families.

(c) Employees shall keep their finger nails short and clean and wash their hands with soap or detergent before commencing work and after each absence, specially after using sanitary conveniences. Towels used for drying hands should be clean.

(d) All employees should be inoculated against typhoid and paratyphoid once in every five years. In case of an epidemic all workers shall be inoculated and a record shall be kept.

(e) No worker shall be allowed to work without proper clothing. Employees shall be provided with clean uniform/aprons and clean washable caps. The uniforms shall not be worn outside the plant but just before starting the work and changed when leaving.

(f) Eating, spitting, nose cleaning, the use of tobacco in any form or chewing betel leaves shall be prohibited within the manufacturing, packing and storage areas of the unit. Notice to this effect shall be prominently displayed.

(g) Sufficient and suitable sanitary conveniences shall be provided, maintained and kept clean. The conveniences shall be properly lighted. No conveniences shall open directly into any work room in the factory.

(h) Sufficient wash basins with adequate provision of soap and towels, latrines and urinals in the prescribed manner should be provided.

**MACHINERY**

1. Bread manufacturer should preferably have the following special equipment's used in preparing bakery products :-

- (a) Mixer. To mix various ingredients to ensure uniform distribution throughout the mass and to form minute bubbles of air to serve as foci for the evolution of carbon dioxide and development of gluten which is critical in the preparation of bread doughs.
- (b) Dough Dividers. To divide a large mass of dough into pieces corresponding to single unit of the finished product.
- (c) Rounders. To close the cut surfaces, from where the gas can readily diffuse. It gives the dough a smooth and dry exterior to reorient the gluten structure.
- (d) Proofing chambers. To hold doughs here in racks under controlled conditions of temperature and humidity before actual baking.
- (e) Baking Equipment. For this purpose conventional/electric ovens may be used.
- (f) Slicing Machine. To slice the cool bread all loaves must be passed through slicing machine.
- (g) Packing Machine. To wrap and pack the bread in clean waxed paper or any other food grade paper to preserve fresh ness, Packing may also be done in printed food grade polythene bag which can be tightened with rubber band.