CHAPTER 2
FOOD PRODUCT STANDARDS

2.6. Fish and Fish Products:

2.6.1 Fish and Fish Products

[36][**1. Frozen shrimp**:

(a) Frozen shrimp which includes shrimps, means the product frozen raw or partially or fully cooked, peeled or unpeeled.

(b) Frozen shrimp is the product obtained from species belonging to Penaeidae, Solenoceridae, Aristeidae, Sergestidae, Hippolytidae, Crangonidae, Palaemonidae and Atyidae. The product after preparation, shall be subject to a freezing process and shall comply with the conditions laid down hereafter; -

(i) the freezing process shall be carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The freezing process shall not be regarded as complete unless and until the product temperatures has reached -18^0C or lower at the thermal centre after thermal stabilisation;

(ii) the water used for cooking shall be of potable quality or clean seawater, which meets the same microbiological standards as potable water and is free from potential contaminants;

(iii) the product shall be kept deep frozen to maintain the quality during transportation, storage and distribution;

(iv) frozen shrimps shall be processed and packaged to minimise dehydration and oxidation;

(v) the practice of repacking frozen products under controlled conditions which shall maintain the quality of the product, followed by the reapplication of the freezing process as defined, is permitted.

(c) Requirements. -

(i)frozen shrimp shall be prepared from sound shrimps or prawns which are of a good quality to be sold fresh for human consumption;

(ii)if glazed, the water used for glazing or preparing glazing solutions shall be of potable quality (IS 10500) or shall be clean sea-water, which meets the same microbiological standards as potable water and is free from potential contaminants;

(iii) other ingredients shall be of food grade quality and conform to all applicable standards prescribed in these regulations.

(d) Food Additives. -

Only those food additives specified under these regulations shall be used.

(e) Hygiene. -

The product shall be prepared and handled in accordance with the guideline specified in Part-II of Schedule 4 of the Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations, 2011 and such guidelines provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(f) Contaminants, Toxins and Residues. -

The products covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and conform to the microbiological requirements specified in Appendix B of these regulations.

(g) Packaging and Labelling. -

The products shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Packaging and Labelling), Regulations, 2011 and shall also apply to the pre-packaged products. The product shall be stored at -18°C or lower and shall be displayed on the label.]

2. **Frozen Lobsters** means the product prepared from fresh lobsters of sound quality belonging to the genus Homarus of the family Nephropidae and from the families Palinuridae and Scyllaride. The Norway Lobster may be prepared from Nephros norvegicus. The product shall not be a mixture of different species.

The product may be raw or cooked. The product may be glazed with water. [82][Omitted]

3. **Frozen squid and parts of squid** means the product prepared from fresh squid of sound quality belonging to squid species of Loliginidae, Ommastrephidae Onychoteuthide and Thysanotenthidae families. The product may be glazed with water. No food additive is allowed in this product. [82][Omitted]

[36][**4**. **Frozen Finfish**:

(a) Frozen finfish means the product frozen from the species as defined below and offered for direct consumption and for further processing.

(b) Frozen finfish refers to finfish species suitable for human consumption, with or without the head, from which the viscera or other organs may have been completely or partially removed. The product after preparation shall be subject to a freezing process and shall comply with the conditions laid down hereafter;-

(i) the freezing process shall be carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The freezing process shall not be regarded as complete unless and until the product temperature has reached -18°C or lower at the thermal centre after thermal stabilization;

(ii) the product shall be kept deep frozen to maintain the quality during transportation, storage and distribution;

(iii) the product shall be processed and packaged to minimise dehydration and oxidation.

(iv) the practice of repacking frozen products under controlled conditions which shall maintain the quality of the product, followed by the reapplication of the freezing process as defined, is permitted.

(c) Requirements. -

(i) frozen finfish shall be prepared from sound fish which are of a good quality to be sold fresh for human consumption;

(ii) if glazed, the water used for glazing or preparing glazing solutions shall be of potable quality (IS 10500: 2012) or shall be clean sea-water, which meets the same microbiological standards as potable water and is free from potential contaminants;

(iii) other ingredients shall be of food grade quality and conform to all applicable standards prescribed in these regulations;

(iv) the raw material shall not contain more than 100 mg/Kg of histamine. This shall only apply to species of Carangidae, Chanidae, Clupeidae, Coryphaenidae, Engraulidae, Istiophoridae, Mugilidae, Pristigasteridae, Scombridae and Xiphiidae.

(d) Food Additives. -

Only those food additives specified under these regulations shall be used.

(e) Hygiene. -

The product shall be prepared and handled in accordance with the guidelines specified in Part-II of Schedule 4 of the Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(f) Contaminants, Toxins and Residues.-

The products covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and conform to the microbiological requirements specified in Appendix B of these regulations.

(g) Packaging and Labelling.-

The products shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Packaging and Labelling), Regulations, 2011and shall apply to the pre-packaged products. The product shall be stored at -18°C or lower and shall be displayed on the label.

5. Frozen fish fillets:

(a) Frozen fish fillets means the product frozen from the species of fish as defined below and offered for direct consumption for further processing.

(b) Frozen fillets are slices of fish which are removed from the carcass of the same species of fish suitable for human consumption by cuts made parallel to the backbone and sections of such fillets cut so as to facilitate packing, and further processing. The product after preparation shall be subject to a freezing process and shall comply with the conditions specified below:-

(i) the freezing process shall be carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The freezing process shall not be regarded as complete unless and until the product temperature has reached -18°C or lower at the thermal centre after thermal stabilization. The product shall be kept deep frozen so as to maintain the quality during transportation, storage and distribution;

(ii) The product shall be processed and packaged so as to minimize dehydration and oxidation;

(iii) re-packing of the frozen products can be carried out under controlled conditions, which will maintain the quality of the product, followed by the re-application of freezing process as mentioned above;

(iv) fillets may be presented as boneless, provided that boning has been completed including the removal of pin- bones.

(c) Requirements.-

(i) Frozen fish fillets shall be prepared from sound fish which are of a good quality to be sold fresh for human consumption;

(ii) if glazed, the water used for glazing or preparing glazing solutions shall be of potable quality (IS 10500) or clean sea-water, which meets the same microbiological standards as potable water and is free from potential food contaminants;

(iii) other ingredients shall be of food grade quality and conform to all applicable standards prescribed in these regulations;

(iv) The raw material shall not contain more than 100 mg/Kg of histamine. This shall only apply to species of Carangidae, Chanidae, Clupeidae, Coryphaenidae, Engraulidae, Istiophoridae, Mugilidae, Pristigasteridae, Scombridae and Xiphiidae.

(d) Food Additives.-

Only those food additives specified under these regulations shall be used**.**

(e) Hygiene.-

The product shall be prepared and handled in accordance with the guidelines specified in Part-II of Schedule 4 of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(f) Contaminants, Toxins and Residues.-

The products covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and shall conform to the microbiological requirements specified in Appendix B of these regulations.

(g) Packaging and Labelling.-

The products shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Packaging and Labelling), Regulations, 2011and shall also apply to the pre-packaged product. The product shall be stored at -18°C or lower and shall be displayed on the label.]

Note I: Products under article 1, 2, 3, 4 AND 5 shall be frozen in an appropriate equipment quickly to minus (-) 18º C or colder in such a way that the range of temperature of maximum crystallization is passed quickly. The quick freezing process shall not be regarded as complete unless the product temperature has reached minus (-) 18º C or colder at the thermal

centre after thermal stabilization. The product shall be kept deep frozen so as to maintain the quality during transportation, storage and sale. The entire operation including processing and packaging shall ensure minimum dehydration and oxidation. The product may contain food additives permitted in Appendix A except listed product under regulation 2.6.1 (3). The product shall conform to the microbiological requirement given in Appendix B. The products shall be free from any foreign matter and objectionable odour/flavour.

[77]**[6. Omitted]**

[12]**[7. Salted fish/dried salted fish: -** (1) Dried/ salted and dried fishery products means the product prepared from fresh or wholesome fish after drying with or without addition of salt.

(2) The fish shall be bled, gutted, beheaded, split or filleted and washed prior to salting and drying.

(3) Salt used to produce salted fish shall be clean, free from foreign matter, show no visible signs of contamination with dirt, oil, bilge or other extraneous materials.

(4) The product shall be free from foreign matter, objectionable odour and flavour.

(5) The product may contain food additives permitted in Appendix A.

(6) The product shall conform to the microbiological and chemical requirement as laid down in the regulation.

(7) The products shall conform to the following requirements:

Sr. No. **(1)**	**Characteristics** **(2)**	**Requirements** **(3)**
1.	Water activity (a_w), at 25°C	Less than 0.78
2.	Salt Content (percent Sodium Chloride)*	Not less than 12 %
3.	Histamine** content, max.	200 mg/Kg
4.	Acid Insoluble Ash on dry basis	Not more than 1%

*Requirement of salt content is only applicable to dry salted fishery products.

** Requirement of Histamine content is only applicable for dried/dry-salted fishery products prepared from listed fish species associated with histamine poisoning.]

[36]**[8. Canned Fishery Products:**

(a) Canned fishery products means canned finfish, crustaceans and molluscs solid packed or packed in oil, water or other suitable medium.

(b) Description

(i)Product Definition

Canned fishery products are obtained from the following categories of finfish, crustaceans and molluscs:

Finfish	**Crustacean**	**Molluscs**
Sardine and other clupeoids *Sardinella longiceps* *Sardinella gibbosa* *Sardinella fimbriata* *Sardinella albella* *Amblygaster sirm* *Dussumieria acuta* *Dussumieria elopsoides* **Tuna and Bonito** *Thunnus*	**Shrimp/prawn*** Species belonging to the family Penaeidae, Solenoceridae, Aristeidae, Sergestidae, Hippolytidae, Crangonidae, Palaemonidae and Atyidae ***Crab***** *Scylla serrata* *Portunus pelagicus* *Potrunus sanguinolentus*	**Mussels** *Perna viridis* *Perna indica* **Squid** *Loligo duvauceli*

alalunga *Thunnus albacares* *Thunnus obesus* *Thunnus maccoyii* *Thunnus thynnus* *Thunnus tonggol* *Euthynnus affinis* *Katsuwonus pelamis* *Sarda orientalis* *Sarda sarda* **Mackerel** *Rastrelliger kanagurta* **Seer fish** *Scomberomorus* spp. **Pomfret** *Pampus argenteus* *Pampus chinensis* *Parastromateus niger*		

* For canned shrimp the head, shell and antennae shall be removed

** Canned crab meat is prepared singly or in combination from the leg, claw, body and shoulder meat from which the shell has been removed.

(ii) Process Definition

Canned fishery products are packed in hermetically sealed containers and shall have received a processing treatment sufficient to ensure commercial sterility.

(iii) Presentation

(1) The product shall be presented in one of the following packing media: own juice, brine or water, edible oil, tomato sauce or curry.

(2) The can shall not show any visible external defects like denting, paneling, swelling or rusting.

(3) The contents of the can, on opening shall not display any appreciable disintegration. Pieces from which portions have separated out would be treated as disintegrated units. The percentage of detached portion of fish calculated on the basis of the drained mass shall not exceed 5 percent by mass based on the average of 5 cans.

(4) The product shall have the odor, flavor and color characteristic of the species.

(5) The canned shrimp product may be presented as:

(a) Peeled shrimp- shrimp which have been headed and peeled without removal of the dorsal tract;

(b) Cleaned or de-veined – peeled shrimp which have had the back cut open and the dorsal tract removed at least up to the last segment next to the tail. The portion of the cleaned or de–veined shrimp shall make up 95% of the shrimp contents;

(c) Broken shrimp – more than 10% of the shrimp contents consist of pieces of peeled shrimp of less than four segments with or without the vein removed;

(d) Canned shrimp may be designated as to size in accordance with the actual count range declared on the label.

(c) Requirements. -

(i)Raw Material

1. Fish

The material used for preparation of canned finfish shall be from sound fish of the species in sub-section 2.1 and of a quality fit to be sold fresh for human consumption.

Heads and gills shall be completely removed, scales and tail may be removed. The fish may be eviscerated. If eviscerated it shall be practically free from visceral parts other than roe, milt or kidney. If ungutted, it shall be practically free from undigested feed or used feed.

2. Shrimp

Shrimp shall be prepared from sound shrimp of the species in sub-section 2.1 which are of a quality fit to be sold fresh for human consumption.

3. Crab meat

Canned crab meat shall be prepared from sound crab of the species specified, which are alive immediately prior to the commencement of processing and of a quality suitable for human consumption.

4. Mussels

The mussels shall be of sound quality and free from any evidence of spoilage and degradation.

5. Squid Rings

Squid rings shall be prepared from sound quality whole cleaned squids without any evidence of spoilage and deterioration.

(ii) Other Ingredients

The packing medium and all other ingredients used shall be of food grade quality and conform to all applicable standards prescribed in these regulations.

(iii) Decomposition

The raw material (fish) shall not contain more than 100 mg/Kg of histamine based on the average of the sample unit tested. This shall apply only to species of fish with potential to form hazardous level of histamine as mentioned in Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011.

(iv) Final Product

The product shall be free from foreign materials, filth and from grittiness. Other parameters like drained weight, disintegrated portion as % of drained weight, medium, percentage of water, vacuum, etc. are mentioned below:

S. No.	**Characteristics**	**Finfish**				**Crustaceans**		**Molluscs**	
		Tuna	**Mackerel**	**Sardine**	**Pomfret/ Seerfish**	**Shrimp/ Prawn**	**Crab**	**Mussel**	**Squid**
1.	Medium	Oil	Oil Brine Curry Tomato Sauce	Oil Brine Curry	Oil	Brine	Brine	Oil	Brine
2.	Drained wt. as % of water capacity*	70	65	70	66	64	65	65	64
3.	% of water in the drained liquid**	5	10	10	10			5	-
4.	Disintegrated portion as % of drained weight (max)	5	5	5	5	5	5	5	5
5.	Vacuum	For round cans 100 mm and negative pressure in flat cans							

	(Minimum)	
6.	Head Space	5-10 mm
7.	Can Exterior	shall not be rusted, dented or bulged

*A tolerance of ±5 percent is permitted

** Only applicable for oil medium

The percentage of sodium chloride in the final product of sardine and mackerel shall be 3.5 percent in the case of brine treated cans. The acidity of brine as citric acid anhydrous shall be between 0.06 and 0.20 percent (m/v).

(v) Contaminants, Toxins and Residues.-

The products covered in this standard shall comply with Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011.

The products covered in this standard shall comply with the microbiological requirements given in Appendix B of these regulations.

(vi) Food Additives.-

Only the food additives permitted under these regulations shall be used.

(vii) Hygienic.-

The product shall be prepared and handled in accordance with the guidelines provided in Schedule 4 of the Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations, 2011 and any other such guidance provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(viii) Packaging and Labelling. -

(a) Canned products shall be packed in suitable containers, free from rust and hermetically sealed. Cans shall be lacquered, the lacquer used shall be non-toxic and shall be of such quality that it does not impart any foreign taste and smell to the contents of the cans and does not peel off during

processing and storage of the product. The lacquer shall not be soluble in oil or brine.

(b) The provisions laid down under Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged product.]

[36][**9. Frozen cephalopods**:

(a) frozen cephalopods means the raw frozen cephalopods and parts of raw cephalopods, as defined below and offered for direct consumption and for further processing.

(b) frozen cephalopods and parts of cephalopods are obtained from the following categories:

Category	***Family***
Squid	Loliginidae Onychoteuthidae Ommastrephidae Thysanoteuthidae
Cuttlefish	Sepiidae Sepiolidae
Octopus	Octopodidae

(c) The product after preparation shall be subject to a freezing process and shall comply with the following conditions:-

(i) the freezing process shall be carried out in appropriate equipment in such a way that the range of temperature of maximum crystallization is passed quickly. The freezing process shall not be regarded as complete unless and until the product temperature has reached -18°C or lower at the thermal centre after thermal stabilization;

(ii) the product shall be kept deep frozen so as to maintain the quality during transportation, storage and distribution;

(iii) frozen cephalopods and parts of cephalopods shall be processed and packaged so as to minimise dehydration and oxidation;

(iv) industrial repacking of intermediate frozen material under controlled conditions which maintain the quality of the product, followed by the reapplication of the quick freezing process as defined above is permitted.

(d) Requirements. -

(i) Frozen cephalopods shall be prepared from sound squid, cuttlefish or octopus which is of a good quality to be sold fresh for human consumption;

(ii) if glazed, the water used for glazing or preparing glazing solutions shall be of potable quality (IS 10500) or shall be clean sea-water, which meets the same microbiological standards as potable water and is free from potential contaminants.

(e) Food Additives. -

Only the food additives specified under these regulations shall be used.

(f) Hygiene. -

The product shall be prepared and handled in accordance with the guidelines specifed in Part-II of Schedule 4 of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and such guideline as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(g) Contaminants, Toxins and Residues. -

The products covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and shall conform to the microbiological requirements specified in Appendix B of these regulations.

(h) Packaging and Labelling. -

The products shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Packaging and Labelling), Regulations, 2011 and shall also apply to the pre-packaged products. The product shall be stored at -18°C or lower and shall be displayed on the label.

10. Smoked Fishery Products:

1. Smoked fishery products means the product smoked, smoke-flavoured and smoke-dried fish prepared from fresh, chilled or frozen raw material. It deals with whole fish, fillets and sliced and similar products thereof. The standard applies to fish, either for direct consumption or for further processing, or for addition into speciality or minced products where fish constitutes only part of the edible contents.

2. The product shall be of following types:

(i)smoked fish is prepared from fish that has undergone hot or cold smoking process. The smoke must be applied through one of the smoking processes defined in regulation 3.0 and the end product must have smoked sensory characteristics. Spices and other optional ingredients may be used.

(ii)smoke-dried fish is prepared from fish that has undergone combined smoking and drying process and may include a salting process as described in regulation 3.0. The smoke must be applied through a traditional or industrial smoke-drying process and the end product must have smoke-dried sensory characteristics. Spices and other optional ingredients may be used.

(iii)smoke-flavoured fish is prepared from fish that has been treated with smoke flavours, without employing a smoking process as described in sub regulation 3.0. The end product must have a smoked taste. Spices and other optional ingredients may be used.

3. Process for smoked fish, smoke – dried fish and smoke-flavoured fish is as follows:

(i) smoking is a process of treating fish by exposing it to smoke from smouldering wood or plant materials. This process is usually characterised by an integrated combination of salting, drying, heating and smoking steps in a smoking chamber:

Provided that wood or other plant material for generation of smoke or smoke- condensates shall not contain toxic substances either naturally or through contamination, or after having been treated with chemicals, paint or impregnating materials and shall be handled in a way to avoid contamination:

Provided further that smoking of fish shall be done in a manner that minimises the formation of polycyclic aromatic hydrocarbons (PAH);

(ii) smoking by regenerated smoke is a process of treating fish by exposing it to smoke which is regenerated by atomizing smoke condensate in a smoking chamber under the time and temperature conditions similar to those for hot or cold smoking;

(iii) smoke condensates are products obtained by controlled thermal degradation of wood in a limited supply of oxygen (pyrolysis), subsequent condensation of the resultant smoke vapours, and fractionation of the resulting liquid products;

(iv) hot smoking is a process in which fish is smoked at an appropriate combination of temperature and time sufficient to cause the complete coagulation of the proteins in the fish flesh; hot smoking is generally sufficient to kill parasites, to destroy non-sporulating bacterial pathogens and to injure spores of human health concern;

(v) cold smoking is a process of treating fish with smoke using a time and temperature combination that will not cause significant coagulation of the proteins in the fish flesh but that will cause some reduction of the water activity;

(vi) salting is a process of treating fish with salt of food grade quality to lower water activity in fish flesh and to enhance flavour by any appropriate salting technology (e.g., dry salting, brining, injection salting);

(vii) drying is a process in which the moisture content in the fish is decreased to appropriate required characteristics under controlled hygienic conditions;

(viii) packaging is a process in which smoked fish is put in a container, either aerobically or under reduced oxygen conditions, including under vacuum or in a modified atmosphere;

(ix) storage is a process in which smoked fish is kept refrigerated or frozen to assure quality and safety of the product;

(x) smoke drying is a process in which fish is treated by combined smoking and drying steps to such an extent that the final product can be stored and transported without refrigeration and to achieve a water activity of 0.75 or less (10% moisture content or less), as necessary to control bacterial pathogens and fungal spoilage;

(xi) smoke flavours are either smoke condensates or artificial flavour blends prepared by mixing chemically-defined substances in known amounts or any combination of both (smoke-preparations);

(xii) smoke flavouring is a process in which fish or fish preparations are treated with smoke flavour. The smoke flavour can be applied by dipping, spraying, injecting, or soaking.

(d) Requirements. -

(i) smoked fish, smoke-flavoured fish and smoke-dried fish shall be prepared from sound and wholesome fish, which may be fresh, chilled or frozen, and of a quality to be sold for human consumption after appropriate preparation;

(ii) other ingredients shall be of food grade quality and conform to all applicable standards prescribed in these regulations.

(e) Food Additive. -

Only the food additives specified under these regulations shall be used.

(f) Hygienic Requirements. -

The product shall be prepared and handled in accordance with the guidelines specified in Schedule 4 of the Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(g) Contaminants, Toxins and Residues. -

The products covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and shall conforms to the microbiological requirements specified in Appendix B of these regulations.

(e) Packaging and Labelling. -

(i) the label shall declare storage and handling instructions appropriate for the product;

(ii) the provisions laid down under Food Safety and Standards (Packaging and Labelling) Regulations, 2011, shall apply to the pre-packaged products.

11. Ready –to-Eat Finfish or Shell Fish Curry in Retortable Pouches:

(a) Ready-to-Eat finfish or Shell fish curry in Retortable Pouches means the product thermal processed instant fish or shell fish curry in retortable pouches.

(b) Definition-

(i) Product Definition-

(1) Ready-To-Eat Finfish/Shellfish Curry in Retortable Pouches is prepared from finfish or shellfish species of sound quality without any visible sign of decomposition.

(2) The product is prepared from the edible portions of sound fish, packed in gravy of spices, vegetable fat and other ingredients appropriate to the product and heat processed by an appropriate manner after being sealed in a container so as to prevent spoilage.

(ii) Process Definition.-

Products are hermetically sealed and shall have received a processing treatment sufficient to ensure commercial sterility.

(iii) The product shall be presented in curry packing medium.

(c) Requirements.-

(i) Raw Material-

The material used for preparation of this product shall be from sound finfish or shellfish species and of a good quality to be sold fresh for human consumption.

For fish, heads and gills shall be completely removed, scales and tail may be removed. The fish may be eviscerated. If eviscerated, it shall be practically free from visceral parts other roe, milt or kidney. If ungutted, it shall be practically free from undigested feed or used feed. For shrimps, heads, shell, antennae shall be completely removed.

(ii) Other Ingredients-

The packing medium and all other ingredients used shall be of food grade quality and conform to all applicable standards prescribed in these regulations. No artificial colouring matter and firming agents shall be used.

(iii) [82][Omitted]

(d) Final Product.-

(i) the finished product shall have the odour, flavour and colour characteristic of the product. The bones shall be soft and yielding;

(ii) the contents of the pouch on opening shall not display any appreciable disintegration. Pieces from which portions have separated out would be treated as disintegrated units. The percentage disintegrated portions of the fish, calculated on the basis of the drained mass shall not exceed 5 % based on the average of five pouches;

(iii) the product shall be free from foreign materials such as sand, dirt and insects, objectionable odour, or flavour;

(iv) the residual air in the pouch after processing shall be less than 2 % of the volume of the pouch contents;

(v) the average proportion of fish to curry in retort pouch shall be in the ratio of 60: 40.

(vi) the percentage of salt in the product shall be 1% to 2%, maximum.

(e)Food Additives.-

Only those food additives specified under these regulations shall be used

(f) Processing.-

(i) The material shall be packed in retortable pouches, exhausted or vacuumized and heat-sealed. Exhausting can be done either by steam injection or hot filling to achieve residual air level of less than 2%.

(ii) Processing (Retorting) shall be done in over pressure autoclave till the product reaches a F_0 value of 8-10 minutes at the slowest heating point. The water used for cooling of retort pouches shall be as per IS 10500:2012 standards and chlorinated to maintain free residual chlorine of less than 2 mg/l.

(g) Hygiene.-

The product shall be prepared and handled in accordance with the guidelines specified in Schedule 4 of the Food Safety and Standards (Licensing and Registration of Food Businesses) Regulations, 2011 and such guideline as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(h) Contaminants, Toxins and Residues.-

(i) The products covered in this standard shall comply with Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011 and shall also conforms to the microbiological requirements of thermally processed fishery products given in Table 1 of Appendix B of these regulations.

(i) Packaging and Labelling.-

(i) the retort pouches shall be packed in suitable retail containers to prevent physical impact during transportation.

(ii) retort pouch materials of food grade quality having the configuration of polyester/aluminium foil/cast polypropylene or four layers consisting of polyester/aluminium foil or aluminium oxide/nylon and cast polypropylene may be used. Other suitable packaging materials which can withstand high temperature and pressure can also be used.

(iii) the pouches shall be of food grade quality. The retort pouch shall have the mechanical properties as under:

Sr. No.	**Characteristics**	**Requirement**
1.	Tensile strength (Kgf/15 mm) machine direction	3.0-5.25
2.	Bond Strength (Kgf/15 mm)	0.225 – 0.750
3.	Heat seal strength (Kgf/15 mm), Min	4.60
4.	Bursting strength (Kg/cm^2), Min	1.74

(iv) the provisions laid down under the Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged product.

12. Sardine Oil:

(a) Sardine oil shall be prepared from fresh or well preserved or frozen sound wholesome sardine fish (*Sardinella longiceps*) either whole or dressed body portion (that is without head entrails and tail fin).

(b) The sardine oil shall be prepared by cooking pressing and separating oil from press liquor by centrifugation or by any other suitable means.

(c) Requirements.-

(i) Sardine oil shall be free from foreign matters in settled or suspended condition, and separated water. The product shall be a bright and clear liquid when heated to a temperature of 40°C.

(ii) it shall be free from any other kind of oil including mineral oils. It shall be free from foul and offensive putrefactive odour and should have only characteristic fish- oil odour.

(iii) it shall be of greenish straw light golden yellow or light brown colour.

(iv) product shall also conform to the requirement given in table below:

Table

Sr. No.	**Characteristics**	**Requirements**
1.	Free faty acids as percent oleic acid, w/w, max	1.0
2.	Moisture, percent by weight, max	0.5
3.	Iodine Value	145-180
4.	Saponifaction value	185-205
5.	Unsaponifiable matter, percent, w/w, max	2.0
6.	Refractive Index (40°C)	1.4739-1.4771

(d) Hygiene. -

The product shall be prepared and handled in accordance with the guidelines specified in Schedule 4 of the Food Safety and Standards (Licensing and

Registration of Food Businesses) Regulations, 2011 and such guideline as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(e) Contaminants, Toxins and Residues.-

The products covered in this Standard shall comply with Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011 and shall conformance to with the microbiological requirements specified in Appendix B of these regulations.

(f) Packaging and Labelling.-

The provisions laid down under Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged product.

Amendment for substitution of highlighted provision

[83][12. Fish Oil:

(1) Fish Oil means oils intended for human consumption derived from the fresh and frozen fish, shellfish and/or their parts.
(2) Named fish oils are derived from specific raw materials which are characteristic of the major fish or shellfish species from which the oil is extracted and source of these oils shall be from Anchovy or Tuna or Krill or Menhaden or Salmon.
(3) Fish oils (unnamed) are derived from one or more species of fish or shellfish, other than named ones and include mixtures with fish liver oils.
(4) Named fish liver oils are derived from the liver of fish and are composed of fatty acids, vitamins or other components that are representative of the livers from the species from which the oil is extracted. Source of oil shall be Cod liver.
(5) Fish liver oil (unnamed) are derived from the livers of one or more species of fish, other than the named ones.
(6) Concentrated fish oils are derived from fish oils which have been subjected to processes that may involve, but are not limited to, hydrolysis, fractionation, winterization and/or re-esterification to increase the concentration of specific fatty acids.
    (i) concentrated fish oil contains 35 to 50 m/m % fatty acids as sum of C20:5 (n-3) eicosapentaenoic acid (EPA) and C22:6 (n-3) docosahexaenoic acid (DHA) in the form of triglycerides and/or phospholipids.
    (ii) highly concentrated fish oil contains more than 50 m/m % fatty acids as sum of EPA and DHA in the form of triglycerides and/or phospholipids.

(7) Concentrated fish oils ethyl esters are derived from fish oils and are primarily composed of fatty acids ethyl esters.

(i) concentrated fish oil ethyl esters contain fatty acids as esters of ethanol of which 40 to 60 m/m % are as sum of EPA and DHA.

(ii) highly concentrated fish oil ethyl esters contain fatty acids as esters of ethanol of which more than 60 m/m % are as sum of EPA and DHA.

(8) These oils shall be clear, free of suspended or other foreign matter, separated water, added coloring or flavoring substances or mineral oil.

(9) It may contain other lipids and unsaponifiable constituents naturally present.

(10) These oils shall be supplied for human consumption after they have undergone further processing, e.g. refining and purification.

(11) The refined fish oils production process typically includes several steps such as repeated heating at high temperatures as well as alkali or acid treatments and repeated removal of the water phase.

(12) Fish oils may also be subjected to processing steps (for example saponification, re-esterification, trans-esterification).

(13) The refined fish oils shall not contain trans fatty acids [excluding C18:1n-7t (Vaccenic acid) and C18:2n-6t, 9t (linolelaidic acid)] more than 2.0 % by mass.

(14) Crude fish oils and crude fish liver oils are oils intended for human consumption after they have undergone further processing, e.g. refining and purification.

(15) These oils shall comply with requirements mentioned under Table: Fatty acid (FA) composition of named fish oil and fish liver oil categories (expressed as percentage of total fatty acids), as applicable, as well as with Appendix A of the Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011.

(16) Quality Parameters. - These oils shall conform to the following specifications, namely:-

(a) Quality Parameters for Fish oils, fish liver oils, concentrated fish oils and concentrated fish oils ethyl esters

TABLE

S. No.	Parameter	Requirement
(1)	(2)	(3)
1	Acid Value	Not more than 3 mg KOH/g
		Not more than 45 mg KOH/g in case of fish oils with a high phospholipid concentration of 30% or more such as krill oil.
2	Peroxide Value	Not more than 5 milliequivalent of active oxygen/kg oil
3	Anisidine value	Not more than 20
4	Total oxidation value (ToTox) where Total oxidation value (ToTox) = 2 x Peroxide value + 1 x Anisidine value	Not more than 26

(b) Fatty acid (FA) composition of named fish oil and fish liver oil categories (expressed as percentage of total fatty acids).

S. No.	Fatty acids	Anchovy oil	Tuna oil	Krill oil	Menhaden oil	Salmon oil		Cod Liver oil
						Wild	Farmed	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	Myristic acid (C14:0)	2.7-11.5	ND-5.0	5.0-13.0	8.0-11.0	2.0-5.0	1.5-5.5	2.0-6.0
2	Pentadecanoic acid (C15:0)	ND-1.5	ND-2.0	NA	ND-1.0	ND-1.0	ND-0.5	ND-0.5
3	Palmitic acid (C16:0)	13.0-22.0	14.0-24.0	17.0-24.6	18.0-20.0	10.0-16.0	6.5-12.0	7.0-14.0
4	Palmitoleic acid [C16:1(n-7)]	4.0-12.6	ND-12.5	2.5-9.0	9.0-13.0	4.0-6.0	2.0-5.0	4.5-11.5
5	Heptadecanoic acid (C17:0)	ND-2.0	ND-3.0	NA	ND-1.0	ND-1.0	ND-0.5	NA
6	Stearic acid (C18:0)	1.0-7.0	ND-7.5	NA	2.5-4.0	2.0-5.0	2.0-5.0	1.0-4.0
7	Vaccenic acid [C18:1(n-7)]	1.7-3.7	ND–7.0	4.7-8.1	2.5-3.5	1.5-2.5	NA	2.0–7.0
8	Oleic acid [C18:1(n-9)]	3.6-17.0	10.0-25.0	6.0-14.5	5.5-8.5	8.0-16.0	30.0-47.0	12.0-21.0
9	Linoleic acid [C18:2(n- 6)]	ND-3.5	ND-3.0	ND-3.0	2.0-3.5	1.5-2.5	8.0-15.0	0.5-3.0
10	Linolenic acid [C18:3(n-3)]	ND-7.0	ND-2.0	0.1-4.7	ND-2.0	ND-2.0	3.0-6.0	ND-2.0
11	γ-linolenic acid [C18:3(n-6)]	ND-5.0	ND-4.0	NA	ND-2.5	ND-2.0	ND-0.5	NA
12	Stearidonic acid [C18:4(n-3)]	ND-5.0	ND-2.0	1.0-8.1	1.5-3.0	1.0-4.0	0.5-1.5	0.5-4.5
13	Arachidic acid (C20:0)	ND-1.8	ND-2.5	NA	0.1-0.5	ND-0.5	0.1-0.5	NA
14	Eicosenoic acid [C20:1(n-9)]	ND-4.0	ND-2.5	NA	ND-0.5	2.0-10.0	1.5-7.0	5.0-17.0
15	Eicosenoic acid [C20:1(n-11)]	ND-4.0	ND-3.0	NA	0.5-2.0	NA	NA	1.0-5.5
16	Arachidonic acid [C20:4(n-6)]	ND-2.5	ND-3.0	NA	ND-2.0	0.5-2.5	ND-1.2	ND-1.5
17	Eicosatetraenoic acid [C20:4(n-3)]	ND-2.0	ND-1.0	NA	NA	1.0-3.0	0.5-1.0	ND-2.0
18	Eicosapentaenoic acid [C20:5(n-3)]	5.0-26.0	2.5-9.0	14.3-28.0	12.5-19.0	6.5-11.5	2.0-6.0	7.0-16.0
19	Heneicosapentaenoic acid [C21:5(n-3)]	ND-4.0	ND-1.0	NA	0.5-1.0	ND-4.0	NA	ND-1.5
20	Erucic acid [C22:1(n-9)]	ND-2.3	ND-2.0	ND-1.5	0.1-0.5	ND-1.5	3.0-7.0	ND-1.5
21	Cetoleic acid [C22:1(n-11)]	ND-5.6	ND-1.0	NA	ND-0.1	1.0-1.5	NA	5.0-12.0
22	Docosapentaenoic acid [C22:5(n-3)]	ND-4.0	ND-3.0	ND-0.7	2.0-3.0	1.5-3.0	1.0-2.5	0.5-3.0
23	Docosahexaenoic acid [C22:6(n-3)]	4.0-26.5	21.0-42.5	7.1-15.7	5.0-11.5	6.0-14.0	3.0-10.0	6.0-18.0

ND=not detectable, defined as ≤0.05% NA=not applicable

(17) Other essential compositional criteria,-

(a) for Anchovy oil from *Engraulis ringens*, the sum of EPA and DHA shall be at least 27% (expressed as percentage of total fatty acids).

(b) for krill oils, the content of phospholipids shall be at least 30 w/w %.

(18) Vitamins,- In addition to quality parameters mentioned in Table relating to Quality Parameters, the fish liver oils shall also comply with the following vitamin requirements, namely:-

Vitamin A	Not less than 40 µg of retinol equivalents/ml of oil
Vitamin D	Not less than 1.0 µg/ml

Losses during processing may be restored by the addition of Vitamin A and its esters and Vitamin D.

(19) Labelling requirements,-

(a) the name of species shall be declared on the label of retail and non-retail containers in case of named fish oils, fish liver oils and its crude forms.

(b) it shall be declared on the label of salmon oil whether the salmon is wild caught or farm-raised.

(c) the content of vitamin A and vitamin D, naturally present or restored, shall be declared on the label of fish liver oils.

(d) the content of EPA and DHA shall be declared on the label of all fish oils and fish liver oils.

(e) in addition to the labelling requirements mentioned above, the provisions prescribed under the Food Safety and Standards (Labelling and Display) Regulations, 2020 shall also apply to these products.]

[This amendment shall come into force on 1st May, 2025]

13. Edible Fish Powder:

(a) Edible fish powder means the product prepared from non-oily white fish like sprats, either from a single species or their mixture. Fresh fish of edible quality which is normally consumed whole should be used for the preparation. Poisonous fish like marine snakes, elasmobranch fish with a high quantity of urea, oily fish and fish with black viscera are not considered suitable for preparation of edible fish powder.

(b) The fish need not be dressed but should be washed and cooked well for the preparation of the powder.

(c) Requirement.-

(i) Edible fish powder shall be a fine powder free from needle-like bones. It shall blend easily with cereal flours. It shall have a faint yellow colour and the characteristic flavour and taste of dry fish. It shall be free from rancidity and off-flavours.

(ii)No organic solvent or chemicals shall be used in its preparation.

(iii)Particle Size – Unless otherwise specified, the edible fish powder shall be of such fineness that it passes completely through a 100-mesh sieve.

(iv) The edible fish powder shall comply with the requirements given in Table below.

[82][(v) The Protein Digestibility Corrected Amino Acid Score (PDCAAS) shall not be less than 0.8.]

Table

Requirement for Edible Fish Powder

Sr. No. (1)	**Characteristic (2)**	**Requirement (3)**
1.	Moisture % by weight, Max	10
2.	Crude protein content (N X 6.25) on dry basis percent by weight, Min	65
3.	Total available lysine g/100g of Protein, Min	6
4.	Fat content on dry basis % by Weight, Max	6
5.	Ash on dry basis % by weight, Max	18
6.	Acid insoluble as on dry basis % by weight, Max	0.5

(d) Food Additives.-

Only the food additives permitted under these regulations shall be used.

(e) Hygiene.-

The product shall be prepared and handled in accordance with the guidelines specified in part-II of Schedule 4 of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(f) Contaminants, Toxins and Residues.-

Product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and conforms to the microbiological requirements specified in Appendix B of these regulations.

(g) Packaging and Labelling.-

(i) The edible fish powder shall be packed in clean sound containers made of tinplate, Post Consumer Recycled Content (PCR C) sheets, cardboard paper or other food grade material to protect it from spillage, contamination, migration of moisture, or air from the atmosphere and seepage of fat into the material through the packing material. When packed in flexible material, the packaging material shall be capable of withstanding handling during transportation. The edible fish powder shall not come in direct contact with packaging material other than grease proof or sulphate paper cellulose paper or any other non-toxic packing material which may be covered with moisture proof laminate or coated paper. When packed in metallic container, the container shall be airtight and completely filled to have minimum air, or the space shall be filled with inert gas or the content held in vacuum.

(ii) The provisions of the Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged products.

14. Fish Pickles:

(a) Fish pickle shall possess a good uniform colour and appearance and shall be practically free from defects, visible fungal growth and disintegration of meat.

(b) The material shall possess a good texture, shall not be unduly hard, or tough, and shall be free from development of any softening.

(c) Requirements,-

(i) Raw material;
(ii) Edible fish;
(iii) Spices and condiments such as ginger garlic, chillies, curry powder;
(iv) Edible common salt;
(v) Preservation media;
(vi) Vinegar (4 % acetic acid); and
(vii) Edible vegetable oils.

The product shall possess the characteristic pleasant aroma and flavour and shall be devoid of any objectionable off -taste smell or odour.

The material shall be free from artificial colouring matter and firming agents other than edible common salt and vinegar.

The material shall conform to the requirement specified in the Table below.

Table
Requirement for Fish Pickles

S. No.	Characteristics	Requirement
1.	Fluid portion % by weight, Max	40
2.	pH	4.0-4.5
3.	Acidity as acetic acid of fluid Portion % by weight, Max	2.5-3.0
4.	Sodium chloride % by weight, Max	12.0

(d) Food Additives.-
Only the food additives specified under these regulations shall be used.

(e) Hygiene.-

The product shall be prepared and handled in accordance with the guidelines specified provided in Part-II of Schedule 4 of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(f) Contaminants, Toxins and Residues.-

Product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and conforms to microbiological requirements specified in Appendix B of these regulations.

(g) Packaging and Labelling.-

(i) fish pickles shall ordinarily be packed in glass containers or in food grade polyethylene pouches as may be found suitable so as to protect it from deterioration;

(ii) the provisions of the Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged products.

15. Frozen Minced Fish Meat:

(a) Frozen minced fish meat means the product frozen and defined below and offered for direct consumption and for further processing.

(b) Raw material.-

(i)clean and fresh fish which do not show any signs of degradation and spoilage shall be used;

(ii)the fish shall be gutted; the tail, entrails, bones, tips, skin, head and other non- edible portion shall be removed and eviscerated. Fish shall be washed thoroughly with clean potable water to remove the blood. The variety of fish used shall be specified;

(iii)the fish shall be properly iced and maintained at a temperature not exceeding 5˚C till transported to the freezing factory.

(c) Requirements.-

(i)Processing-

(1) fresh fish, shall be washed to make free of all foreign matter preferably by eighth chilled potable water (5˚C) having 5 mg/kg (ppm) of available chlorine and meat separated from fish in wholesome condition.

(2) the material shall be quick frozen at a temperature not exceeding -30˚C in polyethylene wrappers and packed in waxed cartons in the minimum possible time.

(3) the quick frozen material shall be stored in the cold storage at a temperature not less than -23 ˚C.

(ii) Finished Products.-

(1) The frozen minced fish meat, on thawing be clean and shall be found undamaged and free from defects. Deterioration, such as dehydration, oxidative rancidity and adverse changes in the texture shall not be present. The product shall be free from foreign matter and finishing agents.

(2) The products shall conform to the requirements specified in the table below:

Table

Requirement for frozen minced fish meat

S. No. **(1)**	**Characteristics** **(2)**	**Requirement** **(3)**
1.	Colour of minced fish meat	Characteristic of the species
2.	Texture of the minced meat	Characteristic of the species
3.	Odour	Characteristic of the species, free from rancid, putrid of foreign odour
4.	Flavour	Characteristic of the species, sweetish and pleasant, free from spoilt or foreign flavour.
5.	Bone content, % by weight, Max	1.0

(iii) Food Additives.-

Only the food additives permitted under these regulations shall be used.

(iv) Hygiene.-

The product shall be prepared and handled in accordance with the guidelines specified in Part-II of Schedule 4 of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

(v) Contaminants, Toxins and Residues.-

The product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011 and conforms to the microbiological requirements specified in appendix B of these regulations.

(vi) Packaging and Labelling.-

The provisions of the Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged products.

16. Freeze dried prawns (shrimps):

(a) Freeze dried prawns (shrimps) means the product freeze dried prawns as defined below and offered for consumption.

(b) The freeze dried prawns shall be of any edible species.

(c) Freeze dried prawns shall be of the following types:

(i) peeled, non-deveined and cooked – head and shell removed completely and cooked.

(ii) peeled, deveined and cooked – head, shell and dorsal tract removed and cooked.

(iii) cooked and peeled – peeled after cooking.

(d) Requirements.-

(i) The raw material shall be prepared from clean, wholesome and fresh prawns, and shall not show any visible sign of spoilage.

(ii) The colour of the raw material shall typically be of freshly caught prawns. The meat shall be firm and shall have the typical odour of

freshly caught prawns. The material shall be free from any discoloration and off odours.

(iii) The water used in the processing of prawns shall be of potable quality and shall contain 5 mg/kg available chlorine.

(iv) The maximum value for moisture content shall be 2.0 percent.

(v) The extent of rehydration shall be minimum 300 percent (IS: IS 14949).

(vi) When observed visually, physical defects for various characteristics shall not exceed the values specified in the table below.

Table

Physical Defects for Various Characteristics

S. No. (1)	**Characteristic (2)**	**Requirement Percent by Count (3)**
1.	Deterioration with spoiled pieces	Nil
2.	Discoloration	3
3.	Black spots	Nil
4.	Broken and damaged pieces	2
5.	Leges, bits of veins etc.	Nil
6.	Foreign matter or filth	Nil

e) Food Additives.-

Only the food additives permitted under these regulations shall be used.

f) Hygiene.-

The product shall be prepared and handled in accordance with the

guidelines specified in Part-II of the Schedule 4 of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

g) Contaminants, Toxins and Residues.-

The product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011and conform with the microbiological requirements specified in Appendix B of these regulations.

h) Packaging and Labelling

The provisions of the Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged products.

17. Frozen clam meat:

a) Frozen clam meat means the product frozen and as defined below and offered for consumption.

b) Frozen clam meat is the picked either raw or after heating from *Vallarta* species or *Meretrix* species or any other edible species of clams and frozen either raw or after cooking.

c) Frozen clam meat shall be of following types:

(i) Raw Frozen Clam Meat (RFCM), and
(ii) Cooked Frozen Clam Meat (CFCM)

Note.– The clams treated with hot water for opening the shell with the meat picked up from it and subsequently frozen shall not be treated as cooked variety.

d) The frozen clam meat shall have the characteristic appearance and colour. It shall be free from discolouration, deterioration, sand particles, pieces of shell, filth or any other foreign matter.

e) Requirements.-

The frozen clam meat shall have a soft and firm texture. The material shall be of reasonably uniform size with broken pieces of meat not exceeding 10 % by count.

f) Food Additives.-

Only the food additives permitted under these regulations shall be used.

g) Hygiene.-

The product shall be prepared and handled in accordance with the guidelines specified in Part-II of Schedule 4 of the Food Safety and Standards (Licensing and Regulation of Food Businesses) Regulations, 2011 and such guidelines as provided from time to time under the provisions of the Food Safety and Standard Act, 2006.

h) Contaminants, Toxins and Residues.-

The product covered in this standard shall comply with the Food Safety and Standards (Contaminants, toxins and Residues) Regulations, 2011and conform with the microbiological requirements specified in Appendix B of these regulations.

i) Packaging and Labelling.-

The provisions of the Food Safety and Standards (Packaging and Labelling), Regulations, 2011, shall apply to the pre-packaged products.]

[57][**18. Live and Raw Bivalve Molluscs:**

Standard specified in this clause shall apply to live bivalve molluscs and to raw bivalve molluscs that have been shucked or frozen or processed to reduce or to limit target organisms while essentially retaining the sensory characteristics of live bivalve molluscs. Raw bivalve molluscs are marketed either in a frozen or chilled state. Both live and raw bivalve molluscs may be intended for direct consumption or further processing. The standard does not apply to scallops when the final product is the adductor muscle only.

(1) LIVE BIVALVE MOLLUSCS

(a) Live bivalve molluscs are products that are alive immediately prior to consumption. Presentation includes the shell.

(b) Live bivalve molluscs are harvested alive from a harvesting area either approved for direct human consumption or classified to permit harvesting for an approved method of purification, e.g. relaying or depuration, prior to human consumption. Both relaying and depuration must be subject to appropriate controls implemented by the official agency having jurisdiction.

(c) Live bivalve molluscs shall possess organoleptic characteristics associated with freshness, as well as an adequate response to percussion (i.e. the shellfish will close by themselves when tapped) and freedom from extraneous matter, as determined by specialists familiar with the species concerned.

(d) Definition of defectives. - A sample unit shall be considered as defective when it exhibits any of the properties defined below, namely:-

(i) Foreign Matter .-The presence in the sample unit of any matter which has not been derived from bivalve molluscs, does not pose a threat to human health and is readily recognized without magnification or is present at a level determined by any method including magnification, that indicates non-compliance with good manufacturing and sanitation practices.

(ii) Dead or Damaged Product.- Dead product is characterized by no response to percussion (i.e. shellfish will close by themselves when tapped). Damaged product includes product that is damaged to the extent that it can no longer function biologically. A Sample unit shall be considered defective if dead or damaged bivalve molluscs exceed 5% by count.

(e) Live bivalve molluscs shall be labelled by weight, count, count per unit weight, or volume as appropriate to the product.

(f) Bivalve shall be alive when sold.

(2) RAW BIVALVE MOLLUSCS

(a) Raw bivalve molluscs processed for direct consumption or for further processing are products that were alive immediately prior to the commencement of processing.

(b) Raw bivalve molluscs shall be of a quality fit for human consumption.

(c) All ingredients used shall be of food grade quality and conform to these regulations.

(d) Definition of defectives.- The sample unit shall be considered as defective when it exhibits any of the properties defined below, namely:-

(i) Deep Dehydration.-greater than 10% of the weight of the bivalve molluscs in the sample unit or greater than 10% of the surface area of the block exhibits excessive loss of moisture clearly shown as white or abnormal colour on the surface which masks the colour of the flesh and penetrates below the surface, and cannot be easily removed by scraping with a knife or other sharp instrument without unduly affecting the appearance of the bivalve mollusks;

(ii) Foreign matter.- The presence in the sample unit of any matter which has not been derived from bivalve molluscs, does not pose a threat to human health and is readily recognized without magnification or is present at a level determined by any method including magnification, that indicates non-compliance with good manufacturing and sanitation practices;

(iii) Odour or flavor.- Persistent and distinct objectionable odours or flavours indicative of decomposition or rancidity;

(iv) Texture. - Textural breakdown of the flesh, indicative of decomposition, characterized by muscle structure that is mushy or paste-like.

(e) The label shall specify the conditions for storage and temperature that will maintain the product safety or viability during transportation, storage and distribution.

19. Sturgeon Caviar:

(1) Standard specified in this clause shall apply to granular sturgeon caviar of the fish of the *Acipenseridae* family.

(2) For the purposes of this clause,-
(a) "fish eggs" means non-ovulated eggs separated from the connective tissue of ovaries. ovulated eggs may be used from aquaculture sturgeons;
(b) "caviar" means the product made from fish eggs of the *Acipenseridae family* by treating with food grade salt.

(3) The product is prepared from fish eggs of sturgeon fishes belonging to the *Acipenseridae* family (four genera *Acipenser, Huso, Pseudoscaphirhynchus* and *Scaphirhynchus* and hybrid species of these genera).

(4) The eggs are of about one size and characteristically coloured according to the species used. Colour can vary from light grey to black or from light yellow to yellowish grey. Brownish and greenish shades are permissible.

(5) The product is made with addition of salt and is intended for direct human consumption. The salt content of the product shall be in the range of 3-5 g/100gm in the end product.

(6) The product, after suitable preliminary preparation of the caviar, shall be subject to treatment or conditions sufficient to prevent the growth of spore and non-spore forming pathogenic microorganisms and shall comply with the conditions laid down hereafter.

(7) Ovulated eggs are harvested after hormonal induction of ovulation of the female. The eggs are appropriately treated to remove adhesive layer and to harden the shell. Permitted harmones may be used to produce ovulated eggs.

(9) During packaging, storage and retail, the product temperature is between 2°C to 4°C, whereas for wholesale business, including storage and transportation, the temperatures are between 0°C to -4°C.

(10) Freezing as well as frozen storage of caviar is not permitted unless the deterioration of quality is avoided.

(11) The product shall be packed in any of the following, namely:-

(a) metal tins coated inside with stable food lacquer or enamel;

(b) glass jars;

(c) other suitable food-grade containers.

(12) Re-packaging of the product from larger to smaller containers under controlled conditions which maintain the quality and safety of the product shall be permitted. No mixing of caviar from different sturgeon species or lots shall be permitted.

(13) Essential Composition and Quality Factors.-

(a) caviar shall be prepared from fish eggs extracted from sound and wholesome sturgeons of biological species of the genera which are of a quality fit to be sold fresh for human consumption.

(b) Salt shall be of food grade quality and conform to sub-regulation 2.9.30.

(14) Definition of defects.- The sample unit shall be considered as defective when it exhibits any of the properties given below, namely:-

(a) Foreign matter.- The presence in the sample unit of any matter which has not been derived from sturgeon eggs, does not pose a threat to human health, and is readily recognised without magnification; or is present at a level determined by any method including magnification, that indicates non-compliance with good manufacturing practices and sanitation practices.

(b) Odour or flaovur.- The product affected by persistent and distinct objectionable odour or flavour indicative of decomposition, oxidation, or taste

of feed (in fish reared in aquaculture), or contamination by foreign substances (such as fuel oil).

(c) consistency and condition.- The presence of hard cover of caviar grains that is not easily chewable or tenuous. The breaking up of the outer membranes when attempting to separate the grains. The Presence of broken eggs or fluid.

(d) Objectionable matter.- The presence of remnants of membranes or secreted fat in finished caviar shall be objectionable.

(15) Only those food additives permitted under these regulations shall be used. The use of colours and texturising agents is not allowed.

20. Fish Sauce:

(1) Standard specified in this clause shall apply to fish sauce produced by means of fermentation by mixing fish and salt and may include other ingredients added to assist the fermentation process. The product is intended for direct consumption as a seasoning, or condiment or ingredient for food. This standard does not apply to fish sauce produced by acid hydrolysis.

(2) Fish sauce is a translucent, not turbid liquid product with a salty taste and fish flavour obtained from fermentation of a mixture of fish and salt.

(3) The product is prepared by mixing fish with salt and is fermented in covered containers or tanks. Succeeding extractions may follow by adding brine to further the fermentation process in order to extract the remaining protein, fish flavour and odour. Other ingredients may be added to assist the fermentation process.

(4) Fish sauce shall be prepared from sound and wholesome fish or parts of fish in a condition fit to be sold fresh for human consumption.

(5) Organoleptic criteria shall be acceptable in terms of appearance, odour and taste as follows:

(a) Fish sauce must be translucent, not turbid and free from sediments except salt crystals;

(b) Fish sauce shall have an odour and taste characteristic of the product;

(c) This product shall be free from foreign matter.

(6) Product shall conforms the following chemical properties, namely:-

(a) Total nitrogen content: not less than 10 g/l. competent authorities may also specify a lower level of total nitrogen if it is the preference of that country;

(b) Amino acid nitrogen content: not less than 40% of total nitrogen content;

(c) pH: between 5.0 - 6.5 typical for a traditional product; but not lower than 4.5 if ingredients are used to assist fermentation;

(d) Salt: not less than 200g/l, calculated as NaCl.

(7) Definition of defectives.- The sample unit shall be considered as defective when it exhibits any of the properties defined below, namely:-

(a) Foreign Matter.- The presence in the sample unit of any matter which has not been derived from salt and fish, does not pose a threat to human health and is readily recognised without magnification or is present at a level determined by any method including magnification, that indicates non-compliance with good manufacturing and sanitation practices;

(b) Appearance.- The presence of any sediments (except NaCl crystals) or cloudiness;

(c) Odour.- A sample unit affected by distinct objectionable odour, e.g. rotten, putrid, rancid, gamey, pungent, etc.;

(d) Taste.- sample unit affected by distinct objectionable taste, e.g. bitter, sour, metallic, taint, etc.

21. Quick Frozen Fish Sticks (fish fingers), Fish Portions and Fish Fillets - Breaded or Battered:

(1) This standard applies to quick frozen fish sticks (fish fingers) and fish portions cut from quick frozen fish flesh blocks, or formed from fish flesh, and to natural fish fillets, breaded or batter coatings, singly or in combination, raw or partially cooked and offered for direct human consumption without further industrial processing.

(2) For the purposes of this clause,-

(a) a fish stick (fish finger) means the product which includes the average percent of fish flesh must not be less than 50 per cent of total weight. Each stick shall be not less than 10 mm thick. A fish portion including the coating may be of any shape, weight or size. Fish sticks or portions may be prepared from a single species of fish or from a mixture of species with similar sensory properties;

(b) fillets are slices of fish of irregular size and shape which are removed from the carcass by cuts made parallel to the back bone and pieces of such fillets, with or without the skin.

(3) The product after any suitable preparation shall be subjected to a freezing process and shall comply with the conditions laid down hereafter.

(4) The freezing process shall be carried out in appropriate equipment in such a way that the range of temperature of maximum crystallisation is passed quickly.

(5) The quick freezing process shall not be regarded as complete unless and until the product temperature has reached -18^0C or colder at the thermal centre after thermal stabilisation. The product shall be kept deep frozen so as to maintain the quality during transportation, storage and distribution.

(6) Industrial repacking or further industrial processing of intermediate quick frozen material under controlled conditions which maintains the quality of the product, followed by the re-application of the quick freezing process, is permitted.

(7) Quick frozen breaded or battered fish sticks (fish fingers) breaded or battered fish portions and breaded or battered fillets shall be prepared from fish fillets or minced fish flesh, or mixtures thereof, of edible species which are of a quality such as to be sold fresh for human consumption.

(8) The products shall not contain more than 10 mg/100 g of histamine based on the average of the sample unit tested. This shall apply all the species mentioned in list of histamine. to species of Clupeidae, Scombridae, Scombresocidae, Pomatomidae and Coryphaenedae families.

(9) Definition of defectives.- the sample unit shall be considered defective when it exhibits any of the properties defined below, namely:-

(a) Foreign Mater (cooked state).- The presence in the sample unit of any matter which has not been derived from fish (excluding packing material), does not pose a threat to human health, and is readily recognised without magnification or is present at a level determined by any method including magnification that indicates non-compliance with good manufacturing and sanitation practices;

(b) Bones (cooked state) (in packs designated boneless).- One bone per kg greater or equal to 10 mm in length, or greater or equal to 1 mm in diameter; a bone less than or equal to 5 mm in length, is not considered a defect if its diameter is not more than 2 mm. The foot of a bone (where it has been attached to the vertebra) shall be disregarded if its width is less than or equal to 2 mm, or if it can easily be stripped off with a fingernail;

(c) Odour and flavor.- A sample unit affected by persistent and distinct objectionable odour and flavours indicative of decomposition, or rancidity or of feed.

(d) Flesh abnormalities objectionable textural characteristics such as gelatinous conditions of the fish core together with greater than 86% moisture found in any individual fillet or sample unit with pasty texture resulting from parasites affecting more than 5% of the sample unit by weight.

(e) The product shall be stored at -18°C or lower and shall be declared on the label.

22. Fresh and Quick Frozen Raw Scallop Products:

(1) This standard applies to bivalve species of the *Pectinidae* family in the following product categories:
(a) "Fresh or Quick Frozen Scallop Meat", which is the scallop adductor muscle meat.
(b) "Fresh or Quick Frozen Roe-on Scallop Meat", which is the scallop adductor muscle meat and attached roe.
(c) Quick Frozen Scallop Meat", or "Quick Frozen Roe-on Scallop Meat", with added water and/or solutions of water and phosphates.

(2) Products covered by this Standard may be intended for direct human consumption or for further processing.

(3) This Standard does not apply to:
(a) scallop meat that is formed, mixed with extenders, or bound by fibrinogen or other binders and;
(b) whole scallops (live, fresh or frozen in which the shell and all viscera are attached). These products are included in the *Standard for Live and Raw Bivalve Molluscs.*

(4) For the purpose of this clause,-
(a) "fresh or quick frozen scallop meat" is prepared by completely removing the adductor muscle from the shell and completely detaching the viscera and roe from the adductor muscle of live scallops. Scallop meat contains no added water, phosphates or other ingredients. The adductor muscle is presented whole;

(b) “fresh or quick frozen Roe-on Scallop meat” are prepared by completely removing the adductor muscle and attached roe from the shell and detaching all other viscera to the extent practical. The roe should remain attached to the adductor muscle. Roe-on scallop meat contain no added water, phosphates, or other ingredients. The adductor muscle and roe are presented whole;

(c) “Quick frozen Scallop Meat”, or “Quick Frozen Roe-on Scallop Meat”, with added water or solutions of water and phosphates contain the products, and a solution of water and/or phosphates and optionally salt.

(5) After the preparation of “Scallop Meat” or “Roe on Scallop Meat” under good hygiene practices, the products are rinsed, drained and stored with a method that minimises absorption of water to the extent that is technologically practicable. The fresh product shall be kept at 4°C or below. Product intended to be frozen shall be subjected to a freezing process carried out in appropriate equipment in such a way that the range of temperature of maximum crystallisation is passed quickly. The recognised practice of repacking quick frozen products under controlled conditions which will maintain the quality of the product, followed by the reapplication of the quick freezing process as defined, is permitted. These products shall be processed and packaged so as to minimise dehydration and oxidation.
Quick Frozen Scallop Meat or Quick Frozen Roe-on Scallop Meat Processed with Added Water or Solution of Water and Phosphates.

(6) The product shall be prepared from sound and wholesome scallops which are of a quality suitable to be sold quick frozen for direct human consumption. Added water and/or solution of water and phosphates and salt are permitted to the extent that the water uptake is accurately measured and labelled and their use is acceptable in accordance with the law or custom of the country in which the product is sold. Water shall be of potable quality, phosphates and salt shall be food grade. If glazed, the water used for glazing or for preparing glazing solutions shall be potable water or clean water.

(7) Definition of defectives.- The sample unit shall be considered as defective when it exhibits any of the properties defined below, namely:-

(a) Deep dehydration.- Greater than 10 per cent of the weight of the scallop meat or greater than 10 per cent of the surface area of the block exhibits excessive loss of moisture clearly shown as white or yellow abnormality on the surface which masks the colour of the flesh and penetrates below the surface, and cannot be easily removed by scraping with a knife or a sharp instrument without unduly affecting the appearance of the product;

(b) Foreign matter.- The presence in the sample unit of any matter which has not been derived from scallops, does not pose a threat to human health, and is readily recognised without magnification or is present at a level determined by any method including magnification that indicates non-compliance with good manufacturing and sanitation practices;

(c) Odour, flaour, texture and colour.- Scallop meat affected by persistent and distinct objectionable odours, flavours, texture or colours indicative of decomposition and/or rancidity; or other objectionable odours, flavours, textures and colours not characteristic of the product;

(d) parasite.- The presence of parasites at an objectionable level;

(e) objectionable matter.- The presence of sand, shell or other similar particles that is visible in the thawed state or detected by chewing during sensory examination at an objectionable level;

(f) exceeding level of added water.- Level of added water exceeding that declared in the label.

(9) The label shall specify the conditions for storage and/or temperature that will maintain the product safety or viability during transportation, storage and distribution.

(10) The product shall be stored at 4°C or below for fresh products and at a temperature of -18°C or below for frozen product processed.]

[72][**23. Pasteurized Fish Sausage**:- (1) The term fish sausage refers to fish mince based product comprising fish mince, seasoning and spices, food

additives, which are mixed thoroughly and stuffed into suitable casing and heat processed to achieve pasteurization. Fish sausage is an emulsion product wherein, myofibrillar proteins from fish are emulsifiers. The major myofibrillar protein fraction, myosin, is responsible for emulsion and texture of heat processed sausage. Pasteurized fish sausage is either ready to eat or can be cooked for further preparation.

(2) Any fish meat of acceptable quality for human consumption or surimi (separated fish flesh water washed, partially dehydrated, mixed with food grade additives, frozen and frozen stored) may be used for fish sausage preparation.

(3) Fish mince is mixed with different food grade additives, seasoning, spices and oil using bowl chopper. The resultant paste shall be stuffed into a suitable casing material (food grade) using stuffer. The stuffed casings shall be sealed or clipped with appropriate material using ringer or clipper. The stuffed and sealed sausages shall pasteurized (F value at 85^0C: 31 min; Z value: 8.9^{o}C) and cooled immediately in chilled water at 4-5^0C for 10 min. The sausages shall be air dried and stored at refrigerated temperature (<3^0C).

(4) The sensory quality of the final product shall be characteristic of the fish used. It shall be free from off odor and devoid any foreign matter. The product shall not have swollen appearance nor phase separation of added oil and water.

(5) The product shall conform to the following requirements, namely:-

Table

Sl. No.	Characteristics / Properties	Requirement
1	Fish mince proportion (min)	65%
2.	Fat (max)	8 %
3.	Binding agent (Food grade starch)- (max)	9 %

4.	Seasoning and spices (max)	5 %

(6) Microbiological specification of pasteurised fish sausage shall be as per Convenience Fishery Products, (Item No. 15 of Microbiological Requirements for fish and fishery products as given under these regulations.)

(7) The level of additives can be same as per the edible casing (e.g. sausage casing) mentioned for food category 08.4 under these regulations.

(8) The products shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Labelling and Display), Regulations, 2020 and shall apply to the pre-packaged products. Fish sausages shall be packed in transparent food grade containers and best before use to be provided.

24. Pasteurised Crab Meat:- (1)Standards specified in this clause shall apply to crab meat that has been cooked, pasteurized and chilled, intended for direct consumption with or without cooking and for further processing.

(2) For the purpose of this clause,

(a) Dressing refers to the process of removing crab back shell, viscera and gills. In some cases it may also include the removal of walking legs and claws. Dressing may take place either before or after cooking

(b) Cooking refers to a heating method of crabs using potable water, clean sea water or brine for a period of time sufficient for the thermal centre to reach a temperature adequate to coagulate the protein.

(c) Hermetically sealed container refers to containers which are designed and intended to protect the contents against the entry of viable microorganisms after closing.

(d) Pasteurization means subjecting crab meat to heat at pre-determined time and temperatures, which inactivates pathogenic micro-organisms of public health concern without noticeable changes in appearance, texture and flavour of the product

(e) Picking refers to the process of removing meat from the crab shell by machine or by hand

(f) Struvite crystals refer to the transparent crystal of magnesium ammonium phosphate which forms during cooling stage following retorting and continues storage. The quantity of magnesium found in seafood and especially in the water used in processing the seafood can be sufficient to cause formation of these crystals during the normal shelf-life of the product.

(3) Pasteurized crab meat is a ready-to-eat product obtained from different parts of the crab, singly or in combination, packed in hermetically sealed containers, pasteurised and stored at chilled condition (<3^{o}C).

(4) Pasteurized crab meat shall be processed from live blue swimming crabs that have been subjected to the following general steps:

a) Washing, cooking, cooling, dressing, picking and sorting using appropriate methods;
b) Packed in cans or other appropriate containers;
c) Pasteurized at sufficient time and temperature; and
d) Cooled using appropriate method

(5) It is recommended that the crab meat shall be pasteurized to a minimum cumulative total lethality of $F_{85}{}^{o}{}_{C}$= 31 minutes, where z = 9^{0} C. Equivalent processes at different temperatures can be calculated using the z values provided.

(6) Any presentation of the product shall be permitted provided that it meets all requirements of this standard; and is adequately described on the label to avoid confusing or misleading the consumer.

(7) Pasteurised crab meat shall be prepared from sound crab, which are alive immediately prior to the commencement of processing and of a quality suitable for human consumption.

(8) All other ingredients used shall be of food grade quality and conform to all applicable FSSR requirements.

(9) The final product shall conform to the following quality requirements for fill of containers or net weight and sensory properties. Rigid container, like cans or plastic cups, shall be well filled with the product, which shall occupy not less than 90% (minus any necessary headspace according to good manufacturing practices) of the water capacity of the container. The water capacity of the container is the maximum volume of distilled water at 20^0C that the sealed container can hold when completely filled.

(10) The product shall have the characteristic colour, odour, taste and texture of the raw material. The final product shall conform to the microbiological requirement as per Convenience Fishery Products, (Item No. 15 of Microbiological Requirements for fish and fishery products as given in these regulations.)

(11) Only Disodium diphosphate or Sodium acid pyrophosphate permitted as per Food Safety and Standards (Food products and Food additives), Regulations 2011 at maximum level of 10mg/kg shall be used.

(12) The products shall comply with the packaging and labelling requirements specified in the Food Safety and Standards (Labelling and Display), Regulations, 2020 and shall apply to the pre-packaged products. The product shall be packed in appropriate hermetically sealed containers, like cans and

flexible containers (e.g. plastic cups) to safeguard the hygienic and other qualities of the food.

(13) Definition of defectives.- The sample unit shall be considered as defective when it exhibits any of the properties defined below, namely:-

(a) Foreign matter.-Presence of any matter in the sample unit which has not been derived from crab meat (excluding packing material), does not pose a threat to human health, and is readily recognized without magnification or is present at a level determined by any method including magnification that indicates non-compliance with good manufacturing and sanitation practices.

(b) Odour and flavour.-Distinct objectionable odours or flavours indicative of decomposition.

(c) Texture.-Soft and mushy texture

(d) Discoloration.-Distinct discolorations characterized by the following:

(i)Blue, brown, black discolorations exceeding 5% by weight of the drained contents; or,

(ii) Black sulphide staining of the meat exceeding 5% by weight of the drained contents

(e) Struvite crystals.-Any struvite crystals greater than 5 mm in length

(f) Shell bits.-Shell bits with 2 mm or greater, of more than ten (10) pieces.

(14) The products shall conform to the microbiological requirement given in Appendix B.

25. Gelatin from Fish Processing Waste.- (1)Gelatin is derived from collagen, which is a natural structural protein, predominantly found in connective tissue of fish and terrestrial animals. Collagen is the most ubiquitous of animal proteins. The fish processing waste comprising of skin, bones, swim bladder and scales are rich in collagen content.

(2) Generally Gelatin obtained from collagen involves three types of processing steps.

In the first step, raw materials are water washed to remove obvious impurities and then treated with alkali and /or acid to weaken the collagen structure by breaking the intermolecular cross-linkages including covalent and hydrogen bonds.

In the second step, the water extraction is performed at elevated temperature (usually > 40^0C) for an appropriate period of time.

In the last step, extracted gelatin is subjected to several separation methods, including filtration, evaporation and deionization followed by drying and grinding.

(3) Essential composition

(a) The gelatin may be classified as Type A or Type B depending on the method employed for extraction. If acid is used for extraction then it is Type Agelatin. If alkali is used for extraction then it is Type B. The pH of Type Agelatin should be in the range of 3.5-5.5 and that of Type B should be in the range of 6.5-7.5

(b)The moisture content of gelatin is in the range of 8-13%. The fat content should be <0.5% and ash content should be <2%. The elemental composition of gelatin is carbon – 50.5%; hydrogen – 6.8%; nitrogen-17%; and oxygen -25.2%.

(c) The amino acid composition of gelatin depends on the source of collagen used. The imino acid content (proline + Hydroxyproline) of gelatin from fish processing waste is lower than that from mammalian source. Glycine accounts for 30% of total residues.

(4) The quality of gelatin is determined by bloom value (gel strength), viscosity, melting and gelling temperature.

(5) For the purpose of this clause,-

(a) Bloom strength (gel strength).-Bloom is a measure of force (weight) required to depress a prescribed area of the surface of the sample a distance of 4 mm.

Based on bloom value obtained gelatins are classified to High bloom gelatin (>300g)' medium bloom gelatin (125-200 g); low bloom gelatin (<100g). Bloom value depends on amino acid composition and components of gelatin

(b) Viscosity. -The viscosity may be measured by simple viscometers or advanced rheometers. The gelatin with viscosity value of 4-6 mPa.s is acceptable.

(c) Melting and gelling temperature. -The gelling temperature of gelatin from fish processing waste varies from 8-24^{0}C and melting temperature varied from 10-28^{0}C. The use of Thermal Analysis and Rheometers are commonly used to determine the gelling and melting temperature.

(6) Microbiological specification shall be as per Convenience Fishery Products, (Item No. 15 of Microbiological Requirements for fish and fishery products as given under these regulations.)]

[81][2.6.2. Limit of Formaldehyde-

(1) The amount of naturally occurring formaldehyde shall not exceed the limit prescribed in the column (2) for different species of fish as mentioned in the table given below: -

Group & Species	**mg/kg, Max.**
Group - I (Marine)	
All finfishes (including Barracuda, Billfishes, Bombay Duck,	4.0

Bullseyes, Catfishes, Croakers, Eels, Filefishes and Puffers, Flat fishes, Goatfishes, Groupers (Rock Cods), Half Beaks and Full Beaks, Horse Mackerel, Leather Jacket (Queen Fish), Mackerel, Mullets, Other Carangids, Other Clupeoids, Anchovies, Other Perches, Pigface Breams, Pomfrets, Ribbon Fish, Sardines, Seer Fishes/Spanish Mackerel, Silver Bellies/Biddies, Snappers, Tarpons, Threadfin Breams, Threadfins, Tuna and Bonitos, White Fish and any other commercial varieties), **elasmobranchs, crustaceans and molluscs except those under Group III & IV**	
Group – II (Freshwater Origin)	
Finfishes (including Indian Major Carps, Minor Carps, Exotic Carps, Freshwater Catfishes, Snakeheads/Murrels, Tilapia, Trout and all other freshwater fin fishes), crustaceans and molluscans	
Group – III (Marine)	
Lizard fishes and any other marine fishes not covered under Group I	8.0
Group – IV (Frozen Stored marine fish products)	
All frozen stored marine fish products	100]