QUALITY AND SAFETY STANDARDS/ REQUIREMENTS FOR FISH AND FISH PRODUCTS

Madhusudana Rao, B.*, Viji P.,

Nearly 90% of the total fish production of India is marketed within the country. Several food standards have been laid down by the Food Safety Standards Authority of India (FSSAI) to ensure the quality of fish and fish products marketed throughout India. These standards have been introduced to protect the consumer's health and are necessary to achieve minimum standards of hygiene and cleanliness in fish handling, processing and marketing. Following are the quality requirements given by FSSAI for different kind of fish and fish products.

Table 1. Microbiological parameters for Chilled Finfish

	Sampling Plan		Limits		Action in case of unsatisfactory results
Hygiene Indicator Organisms					Improvement in hygiene; Time-Temperature Control along value chain
	n	c	m	M	
Aerobic Plate Count	5	3	$5x10^5$cfu /g	$1x10^7$ cfu/g	
Safety Indicator Organisms					
Escherichia coli	5	3	11 MPN/g	500 MPN/g	
Salmonella	5	0	Absent/25g		
Vibrio cholerae (01 and 0139)	5	0	Absent/25g		

Table 2. Microbiological parameters for Chilled shrimp (Crustaceans)

	Sampling Plan		Limits		Action in case of unsatisfactory results
	n	c	m	M	Improvement in hygiene; Time-Temperature Controlalong value chain
Hygiene Indicator Organisms					
Aerobic Plate Count	5	3	1x106cfu/g	1x107cfu/g	

Safety Indicator Organisms				
Escherichia coli (MPN)	5	3	11 /g	500 /g
Salmonella	5	0	Absent/25g	
Vibrio cholerae (01 and 0139)	5	0	Absent/25g	

Where

n : Number of units comprising the sample

c : Maximum allowable number of defective sample units

m : Acceptable level in a sample

M : Specified level when exceeded in one or more samples would cause the lot to be rejected

Table 3. Microbiological Requirements for Raw-Frozen Crustaceans (FSSAI, 2017)

	Sampling Plan		**Limits (cfu/g)**		**Action in case of Unsatisfactory results**
Hygiene Indicator Organisms	n	c	m	M	
Aerobic Plate Count (cfu /g)	5	3	$1x10^6$	$1x10^7$	Improvement in hygiene; Time-Temperature Control along value chain
Safety Indicator Organisms					
Escherichia coli	5	3	11 MPN/g	500 MPN/g	
Salmonella	5	0	Absent/25g		
Vibrio cholerae (01 and 0139)	5	0	Absent/25g		

Where,

n : Number of units comprising the sample

c : Maximum allowable number of defective sample units

m : Acceptable level in a sample

M : Specified level when exceeded in one or more samples would cause the lot to be rejected

Table 4. Microbiological Requirements for Cooked-Frozen Crustaceans (FSSAI, 2017)

	Sampling Plan		Limits (cfu/g)		Action in case of Unsatisfactory results
Hygiene Indicator Organisms	n	c	m	M	
Aerobic Plate Count (cfu/g)	5	2	$1x10^5$	$1x10^6$	Improvement in hygiene; Time-Temperature Control along value chain
Coagulase positive Staphylococci (cfu/g)	5	2	$1x10^2$	$1x10^3$	
Safety Indicator Organisms					
Escherichia coli	5	2	1 MPN/g	10 MPN/g	
Salmonella	5	0	Absent/25g		
Vibrio cholerae (01 and 0139)	5	0	Absent/25g		
Listeria monocytogenes	5	0	Absent/25g		

Table 5. Microbiological Requirements for Battered and Breaded shrimp products (FSSAI, 2017)

	Sampling Plan		Limits (cfu/g)		Action in case of Unsatisfactory results
Hygiene Indicator Organisms	n	c	m	M	
Aerobic Plate Count (cfu/g)	5	2	$1x10^5$	$1x10^7$	Improvement in hygiene; Time-Temperature Control along value chain
Coagulase positive Staphylococci (cfu/g)	5	1	$1x10^2$	$1x10^3$	
Yeast and Mold count	5	0	100		
Safety Indicator Organisms					
Escherichia coli	5	2	11 MPN/g	500 MPN/g	
Salmonella	5	0	Absent/25g		
Vibrio cholerae (01 and 0139)	5	0	Absent/25g		
Listeria monocytogenes	5	0	Absent/25g		

Table 6. Antibiotic residue in farmed shrimp / crustaceans (FSSAI, 2011)

Chemical hazardAntibiotics	Maximum Residue limit (MRL)
Tetracycline	0.1 ppm
Oxytetracycline	0.1 ppm
Trimethoprim	0.05 ppm
Oxalinic Acid	0.3 ppm
Chloramphenicol	Below MRPL*
Nitrofurans (metabolites)	Below MRPL

Table 7. Heavy metals in fin fishes and crustaceans

Lead 1. Fin fishes : 0.3 ppm 2. Crustaceans : 0.5 ppm 3. Cephalopods : 1 ppm 4. Bivalve mollusks : 1.5 ppm 5. Canned fish : 5.0 ppm	**Cadmium** 1. Fin fishes : 0.3 ppm 2. Crustaceans : 0.5 ppm 3. Cephalopods : 2 ppm 4. Bivalve mollusks : 2 ppm
Mercury 1. Non predatory fishes : 0.5 ppm 2. Predatory fishes : 1.0 ppm 3. Crustaceans : 0.5 ppm 4. Cephalopods : 0.5 ppm 5. Bivalve mollusks : 0.5 ppm	**Arsenic** 1. Fin fishes : 76 ppm 2. Crustaceans : 76 ppm 3. Molluscs : 86 ppm
Chromium All fishery products: 12 ppm	**Tin**· Canned fish : 200 ppm

Table 8. Microbiological Requirements for Dried Fishery Products (FSSAI, 2017)

	Sampling Plan		Limits (cfu/g)		Action in case of Unsatisfactory results
Hygiene Indicator Organisms	n	c	m	M	Improvement in hygiene; Selection of raw material; Adequate drying (water activity $\leq$ 0.78)
Aerobic Plate Count	5	0	$1x10^5$	-	
Yeast & mold count	5	2	100	500	
Safety Indicator Organisms					
Escherichia coli	5	0	20 MPN/g		
Salmonella	5	0	Absent/25g		

Table 9. Requirements for Edible fish powder (FSSAI, 2017)

Sl. No	Characteristics	Requirement
1	Moisture, Percentage by weight, Maximum	10
2	Crude protein content (Nx 6.25) percentage by weight on dry basis, minimum	65
3	Total available lysine (g/100 g of protein), minimum	6
4	Fat content on dry basis (percentage by weight), maximum	6
5	Ash on dry basis percentage by weight , Max.	18
6	Acid insoluble ash on dry basis, % by weight ,Maximum	0.5

Table 10. Requirements for Fish Pickles (FSSAI, 2017)

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