Microbiological Thresholds for Seafood Products – Market Overview

Several individual markets have established specific microbiological threshold values for seafood products, including specific limits for pathogens such as Salmonella, Listeria monocytogenes, Escherichia coli, and Vibrio spp. These thresholds come in addition to general food legislation, which typically specifies that food must be produced safely and be safe to eat. The requirements vary between countries. Upon export, products may be inspected and analyzed for these microorganisms at border control. Note that the information compiled by the Norwegian Seafood Council should be considered as guidance, and we recommend that you consult the specific standard relevant to your market before export. Several markets have specific microbiological standards for individual products, typically processed products. Unless otherwise stated, units are given in cfu/g.

Sampling plan

The microbiological criteria in this document are expressed using the following terms:

n = Number of sample units
c = Maximum number of sample units with counts between m and M
m = Microbiological limit below which results are considered acceptable
M = Microbiological limit above which results are considered Unnacceptable

Market	Standard/Regulation	Product	Microorganism	n	c	m	M	Notes
Brazil	Instruction Normative No. 60, of December 23, 2019	Fresh and frozen seafood	*Coagulase-positive staphylococci/g*	5	2	100	1000	
			Escherichia coli/g, for products not consumed raw	5	2	5	500	
			Salmonella	5	0	0	-	*Abcent in 5 samples/25g*
		Fish and seafood salted or dried	*Escherichia coli/g*	5	2	10	100	
			Salmonella	5	0	0	-	*Abcent in 5 samples/25g*
		Processed seafood - Eg. Smoked, breaded.	*Coagulase-positive staphylococci/g*	5	2	100	10000	
			Escherichia coli/g	5	2	5	500	
			Salmonella	5	0	0	-	*Abcent in 5 samples/25g*
		RTE seafood - not heat treated eg. Sushi	*Coagulase-positive staphylococci/g*	5	2	10	100	
			Escherichia coli/g,	5	2	1	100	
			Salmonella	5	0	0	-	
			Listeria monocytogens	5	0	100	-	
United Arab emirates	GCC Standard GSO 1016/2015	Fresh and frozen fish	*Aerobic plate count*	5	2	1000	1 000 000	
			Escherichia coli	5	3	10	500	
			Vibrio parahaemolyticus	5	0	100	1000	
			Clostridion botulinum	5	0	0	-	*Absent in 5 samples*
			Aeromonas ssp.	5	0	100	1000	
		Fresh and frozen crustaceans	*Aerobic plate count*	5	2	500 000	10 000 000	
			Escherichia coli	5	3	10	500	
			Salmonella	5	0	0	-	*Absent in 5 samples*
			Vibrio parahaemolyticus	5	1	100	1000	
			Listeria monocytogens	5	0	0	-	*Absent in 5 samples*
			Staphyloccus aureus	5	2	100	1000	
		Smoked fish	*Aerobic plate count*	5	3	500 000	1 000 000	
			Escherichia coli	5	3	10	500	
			Vibrio parahaemolyticus	5	1	100	1000	
			Listeria monocytogens	5	0	0	-	*Absent in 5 samples*
			Staphyloccus aureus	5	1	1000	10 000	
EU	Commission Regulation (EC) No 2073/2005	Seafood/Food in general	*Listeria monocytogenes*	5	0	100	-	RTE food. Eg. Sushi. Products placed on the market during their shelf-life
				5	0	0	-	RTE food. Eg. Sushi *Absence in 25g
			E.coli	5	2	1	10	Products of cooked crustaceans and molluscs, shelled and cleaned.
			Coagulase-positive staphylococci	5	2	100	1000	
			Salmonella	5	0	0	-	Cooked crustaceans and molluscan shellfish, *Absence in 25g

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India	Food products standards regulations, 2011. Annex B	Fresh and frozen finfish	*Aerobic plate count*	5	3	500 000	10 000 000	
			Escherichia coli	5	3	11	500	
			Salmonella	5	0	0	-	Absent in 25g
			Vibrio cholerae	5	0	0	-	Absent in 25g
		Fresh and frozen Crustaceans	*Aerobic plate count*	5	3	5 000 000	10 000 000	
			Escherichia coli	5	3	11	500	
			Salmonella	5	0	0	-	Absent in 25g
			Vibrio cholerae	5	0	0	-	Absent in 25g
China	National Food Safety Standards - GB 10136-2015 + GB 29921-2021	Aquatiq products	*Aerobic plate count*	5	2	50 000	100 000	
			Coliforms	5	2	10	5x10	
			Salmonella	5	0	0	-	*Absent in 5 samples*
			Vibrio parahaemolyticus	5	1	100	1000	
			Listeria monocytogenes	5	0	100	-	Limit is 100 cfu/g, however border inspections usually look for precence. Also see GB 31607 - 2021
	GB 31607-2021: National Food Safety Standard – Limits of Pathogenic Bacteria in Bulk Ready-to-Eat Food	Bulk Ready-to-Eat Food	*Salmonella*	-	-	0	-	in 25g
			Staphylococcus aureus	-	-	1000	-	
			Listeria monocytogenes	-	-	0	-	in 25g
			Vibrio parahaemolyticus	-	-	1000		
Saudi-Arabia	GCC Standard GSO 1016/2015	Fresh and frozen fish	*Aerobic plate count*	5	2	1000	1 000 000	
			Escherichia coli	5	3	10	500	
			Vibrio parahaemolyticus	5	0	100	1000	
			Clostridion botulinum	5	0	0	-	*Absent in 5 samples*
			Aeromonas ssp.	5	0	100	1000	
		Fresh and frozen crustaceans	*Aerobic plate count*	5	2	500 000	10 000 000	
			Escherichia coli	5	3	10	500	
			Salmonella	5	0	0	-	*Absent in 5 samples*
			Vibrio parahaemolyticus	5	1	100	1000	
			Listeria monocytogens	5	0	0	-	*Absent in 5 samples*
			Staphyloccus aureus	5	2	100	1000	
		Smoked fish	*Aerobic plate count*	5	3	100 000	1 000 000	
			Escherichia coli	5	3	10	500	
			Vibrio parahaemolyticus	5	1	100	1000	
			Listeria monocytogens	5	0	0	-	*Absent in 5 samples*
			Staphyloccus aureus	5	1	1000	10 000	
South-Korea	Korean Food Code, Chapter 2 (3.4) and 5 (20.1)	Seafood fresh/frozen - unprocessed	*Aerobic plate count*	5	2	100 000	500 000	
			Escherichia coli	5	2	10	-	
			Listeria monocytogens	5	0	0	-	*Absent in 5 samples*
			Salmonella	5	0	0	-	*Absent in 5 samples*
			Staphylococcus aureus	5	0	100	-	
			Vibrio cholerae	5	0	0	-	*Absent in 5 samples*
			Vibrio parahaemolyticus	5	0	100	-	
			Vibrio vulnificus	5	0	0	-	*Absent in 5 samples*
Taiwan	Sanitation Standard for Microorganisms in Foods 2020	General foods	*Coliform bacteria*	-	-	-	1000	Unit is MPN/g, sample size not specified
		General foods	*Escherichia coli*	-	-	-	0	Unit is MPN/g, absent in 25g, Sample size not specified
		All fishery products	*Salmonella*	5	0	0	0	Unit is MPN/g, absent in 25g
		Frozen and raw aquatiq products	*Escherichia coli/g*	-	-	-	50	
		Ready-to-eat aquatic products	*Vibrio parahaemolyticus*	-	-	-	100	Unit is MPN/g, sample size not specified
		Ready-to-eat aquatic products	*Listeria monocytogenes*	-	-	-	100	
Strorbritannia (UK)	Retained EU Regulation 2073/2005 (UK Food Safety and Hygiene Regulations)	Seafood/Food in general	*Listeria monocytogenes (RTE food)*	5	0	100	-	RTE food. Eg. Sushi. Products placed on the market during their shelf-life
				5	0	0		RTE food. Eg. Sushi *Absence in 25g
			E.coli	5	2	1	10	Produkter av kokte krepsdyr og bløtdyr uten skall og renset.
			Coagulase-positive staphylococci	5	2	100	1000	Produkter av kokte krepsdyr og bløtdyr uten skall og renset.
			Salmonella	5	0	0	-	Cooked crustaceans and molluscan shellfish, *Absence in 25g
USA	General prohibitions - FDA guidance	All fishery products	*Clostridium botulinum*	-	-	-	0	USA has no specific microbiological limit regulation for fish; instead, the general ban on "adulterated food" in the Federal Food, Drug, and Cosmetic Act applies. FDA guidance may serve as best practice but is not legally binding.
			Salmonella	-	-	-	0	
			Staphylococcus aureus	-	-	-	10 000	
		Raw fish RTE	*Listeria monocytogenes*	-	-	-	0	
			Vibrio cholerae	-	-	-	0	
		Fish heat treated	*Vibrio spp.*	-	-	-	0	

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Vietnam	No. 46/2007/QD-BYT, QCVN 8-3: 2012/BYT	Fersh and frozen finfish that require heat treatment	*E.coli*	-	-	-	100	
			Staphylococcus aureus	-	-	-	100	
			Clostridium perfringens	-	-	-	100	
			Salmonella/g	-	-	-	0	
			Vibrio parahaemolyticus	-	-	-	100	
		Products of fish and aquatiq animals (ready to eat without heat treatment)	*Coliform bacteria*	-	-	-	10	
			E.coli	-	-	-	3	
			Staphylococcus aureus	-	-	-	10	
			Clostridium perfringens	-	-	-	10	
			Salmonella	-	-	-	0	
			Vibrio parahaemolyticus	-	-	-	10	