

Food & Drug Administration Established Time/Temperature Guidance for Controlling Pathogen Growth and Toxin Formation in Seafoods

Potentially Hazardous Condition	Product Temperature	Maximum Cumulative Exposure Time
Growth and toxin formation by <i>Bacillus cereus</i>	39.2-43°F (4-6°C) 44-50°F (7-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	5 days 17 hours* 6 hours* 3 hours
Growth of <i>Campylobacter jejuni</i>	86-93°F (30-34°C) Above 93°F (above 34°C)	48 hours 12 hours
Germination, growth, and toxin formation by <i>Clostridium botulinum</i> type A, and proteolytic B and F	50-70°F (10-21°C) Above 70°F (above 21°C)	11 hours 2 hours
Germination, growth, and toxin formation by <i>Clostridium botulinum</i> type E, and nonproteolytic B and F	37.9-41°F (3.3-5°C) 42-50°F (6-10 °C) 51-70°F (11-21°C) Above 70°F (above 21°C)	7 days >2 days 11 hours 6 hours
Growth of <i>Clostridium perfringens</i>	50-54°F (10-12°C) 55-57°F (13-14 °C) 58-70°F (15-21°C) Above 70°F (above 21°C)	21 days 1 day 6 hours* 2 hours*
Growth of pathogenic strains of <i>Escherichia coli</i>	44.6-50°F (7-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	14 days 6 hours 3 hours
Growth of <i>Listeria monocytogenes</i>	31.3-41°F (-0.4-5°C) 42-50°F (6-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	7 days 2 days 12 hours* 3 hours*
Growth of <i>Salmonella</i> species	41.4-50°F (5.2-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	14 days 6 hours 3 hours

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Growth of <i>Shigella</i> species	43-50°F (6.1-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	14 days* 12 hours* 3 hours*
Growth and toxin formation by <i>Staphylococcus aureus</i>	44.6-50°F (7-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	14 days 12 hours* 3 hours
Growth of <i>Vibrio cholerae</i>	50°F (10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	21 days 6 hours* 2 hours*
Growth of <i>Vibrio parahaemolyticus</i>	41-50°F (5-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	21 days 6 hours* 2 hours*
Growth of <i>Vibrio vulnificus</i>	46.4-50°F (8-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	21 days 6 hours 2 hours
Growth of <i>Yersinia enterocolitica</i>	29.7-50°F (-1.3-10°C) 51-70°F (11-21°C) Above 70°F (above 21°C)	1 days 6 hours 2.5 hours
* Additional data needed.		
THESE ARE YOUR ONLY TIME TEMPERATURE CONCERNS LISTED BELOW		
37.9-41°F (3.3-5°C) 42-50°F (6-10 °C) 51-70°F (11-21°C) Above 70°F (above 21°C)	7 days >2 days 11 hours 6 hours	