

## Thermal Death Points of Target Organisms

Pathogen/Organism	Group	Disease Affect	Thermal Death Point	Time Required	Reference/Source*
<i>Brucella melitensis</i>	Bacteria	Human Animal	55°C/130°F 60°C/140°F	30 minutes 15 minutes	Hampil, 1932; Zwick & Wedeman, 1913
<i>Burkholderia mallei</i>	Bacteria	Human Bio Warfare	55°C/130°F	10 minutes	Health Canada, 2007
<i>Campylobacter</i> spp.	Bacteria	Human	75°C/167°F	1 minute	Gerba, 1997; Bandres et al., 1988
<i>Chlamydia psittaci</i>	Bacteria	Human, Avian	56°C/133°F	5 minutes	TIP, 2000; Anderson et al., 1997
<i>Chryseobacterium meningosepticum</i>	Bacteria	Human	63°C/145°F	15 minutes	Dumalisile, et al., 2005
<i>Corynebacterium diphtheriae</i>	Bacteria	Human	55°C/130°F 70°C/158°F	45 minutes 4 minutes	Jones & Martin, 2003; Stern, 1974
Dysentery bacilli ( <i>Shigella</i> )	Bacteria	Human	58-60°C/140°F	10 minutes	Hampil, 1932; Runge & O'Brien, 1924
<i>Enterococcus faecium</i>	Bacteria	Human	60°C/140°F 62.5°C/145°F 65°C/149°F	<45 minutes <20 minutes <10 minutes	Spelina et al., 2007
<i>Escherichia coli</i>	Bacteria	Human	45°C/113°F 60°C/140°F 65°C/149°F 70°C/158°F 75°C/167°F	24 hours 105 minutes 45 minutes 45 minutes 15 minutes	Abbott, 2011
<i>Escherichia coli</i>	Bacteria	Human	60°C/140°F	45 minutes	Padhye & Doyle, 1992
<i>Escherichia coli</i>	Bacteria	Human	65°C/149°F	1 minute	Gerba, 1997; Bandres et al., 1988
<i>Escherichia coli</i>	Bacteria	Human	60°C/140°F 70°C/158°F	60 minutes 5 minutes	Jones & Martin, 2003; Stern, 1974
<i>Escherichia coli</i>	Bacteria	Human	55°C/130°F 60°C/140°F	60 minutes 20 minutes	Jones & Martin, 2003; Day & Shaw, 2000
<i>Escherichia coli</i>	Bacteria	Human	55°C/130°F 60°C/140°F	60 minutes 20 minutes	Jones & Martin, 2003; Golueke, 1982
<i>Escherichia coli</i>	Bacteria	Human	63°C/145°F	25 minutes	Dumalisile, et al., 2005

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<i>Hemophilus influenzae</i>	Bacteria	Human	62°C/144°F	2 minutes	Hampil, 1932; Onorato, 1902
<i>Klebsiella pneumoniae</i>	Bacteria	Human	45°C/113°F 60°C/140°F 65°C/149°F 70°C/158°F	24 hours 105 minutes 45 minutes 45 minutes	Abbott, 2011
<i>Legionella</i>	Bacteria	Human	66°C/142°F	.45 minutes**	Gerba, 1997; Sarden et al., 1989
<i>Legionella pneumophila</i>	Bacteria	Human	60°C/140°F	30 minutes	Stout, et al., 1986
<i>Listeria monocytogenes</i>	Bacteria	Human	63°C/145°F	30+ minutes	Rowan and Anderson 1998
<i>Listeria monocytogenes</i>	Bacteria	Human	63°C/145°F	20 minutes	Dumalisile, et al., 2005
Meningococci	Bacteria	Human	60°C/140°F	1 minute	Hampil, 1932; Bettencourt and Franca, 1904
<i>Mycobacterium avium</i> sub. <i>paratuberculosis</i>	Bacteria	Human	62°C/144°F 71°C/160°F	23 minutes 73 seconds	Sung & Collins, 1998
<i>Mycobacterium diphtheriae</i>	Bacteria	Human	55°C/130°F 70°C/158°F	45 minutes 4 minutes	Jones & Martin, 2003; Stern, 1974
<i>Mycobacterium</i> spp. <i>M. avium</i>	Bacteria	Human	70°C/158°F	2 minutes 2.3 minutes**	Gerba, 1997; Robbecke and Buchhottz, 1992
<i>Mycobacterium avium</i> sub. <i>paratuberculosis</i>	Bacteria	Human	72°C/162°F	15 seconds	Pearce, 2001
<i>Mycobacterium tuberculosis</i>	Bacteria	Human	63°C/145°F	3 minutes	Hampil, 1932; North & Park, 1925
<i>Mycobacterium tuberculosis</i>	Bacteria	Human	70°C/158°F	20 minutes	Jones & Martin, 2003; Stern, 1974
<i>Mycobacterium tuberculosis</i>	Bacteria	Human	63°C/145°F 72°C/162°F	30 minutes 15 seconds	Connor, 2007
Paratyphoid bacilli	Bacteria	Human	60°C/140°F 63°C/145°F	20 minutes 3 minutes	Hampil, 1932; Krumwiede & Noble, 1921 Hampil, 1932; Orskov, 1926
<i>Pasteurella multocida</i>	Bacteria	Human and Avian	56°C/133°F 60°C/140°F	15 minutes 10 minutes	TIP, 2000; Rimler and Glisson, 1998
<i>Pasteurella</i> spp.	Bacteria	Human	55°C/131°F	15 minutes	Health Canada, 2007
Pneumococci	Bacteria	Human	60°C/140°F	30 minutes	Hampil, 1932; Baggar, 1926

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<i>Pseudomonas aeruginosa</i>	Bacteria	Human	45°C/113°F 60°C/140°F 65°C/149°F 70°C/158°F	4 hours 75 minutes 45 minutes 45 minutes	Abbott, 2011
<i>Pseudomonas aeruginosa</i>	Bacteria	Human	60°C/140°F	<10 minutes	Spinks, et al., 2003
<i>Pseudomonas putida</i>	Bacteria	Human	63°C/145°F	20 minutes	Dumalisile, et al., 2005
<i>Salmonella</i>	Bacteria	Human	60°C/140°F	1 hour	Feachem, 1983
<i>Salmonella</i> sp.	Bacteria	Human	65°C/149°F	1 minute	Gerba, 1997; Bandres et al., 1988
<i>Salmonella newport</i>	Bacteria	Human	60°C/140°F 65°C/149°F	40 minutes 30 minutes	Wiley & Westerberg (1969)
<i>Salmonella typhi</i>	Bacteria	Human	60°C/140°F 70°C/158°F	30 minutes 4 minutes	Jones & Martin, 2003; Stern, 1974
<i>Shigella</i> sp.	Bacteria	Human	50°C/122°F	1 hour	Jones & Martin, 2003; Stern, 1974
<i>Shigella</i> sp.	Bacteria	Human	55°C/131°F	1 hour	Feachem, 1983
<i>Shigella</i> spp.	Bacteria	Human	65°C/149°F	1 minute	Gerba, 1997; Bandres et al., 1988
Staphylococci	Bacteria	Human	62°C/144°F	10 minutes	Hampil, 1932; Sternburg, 1887
<i>Staphylococcus aureus</i>	Bacteria	Human	45°C/113°F 50°C/122°F 60°C/140°F 65°C/149°F 70°C/158°F	96 hours 48 hours 105 minutes 45 minutes 45 minutes	Abbott, 2011
Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA)	Bacteria	Human	50°C/122°F 65°C/149°F 70°C/158°F	24 hours 45 minutes 45 minutes	Abbott, 2011
<i>Staphylococcus aureus</i>	Bacteria	Human	50°C/122°F	10 minutes	Jones & Martin, 2003; Golueke, 1982
<i>Staphylococcus aureus</i>	Bacteria	Human	63°C/145°F	20 minutes	Dumalisile, et al., 2005
Streptococci	Bacteria	Human	60°C/140°F	30 minutes	Hampil, 1932; Ayers & Johnson, 1918
<i>Streptococcus pyogenes</i>	Bacteria	Human	54°C/129°F	10 minutes	Jones & Martin, 2003; Golueke, 1982
<i>Streptococcus pyogenes</i>	Bacteria	Human	55°C/131°F	10 minutes	Jones & Martin, 2003; Day & Shaw, 2000
<i>Vibrio cholera</i>	Bacteria	Human	55°C/131°F	1 minute**	Gerba, 1997; Roberts & Gilbert, 1979

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<i>Vibrio cholerae</i>	Bacteria	Human	55°C/131°F	15 minutes	Hampil, 1932; Kitasato, 1889
<i>Yersinia enterocolitica</i>	Bacteria	Human	60°C/140°F	30 minutes	Gerba, 1997; Frazier and Westhoff, 1988
<i>Coxiella burnetii</i>	Bacteria Rickettsia	Human Q Fever	63°C/145°F	30 minutes	Connor, 2007
<i>Coxiella burnetii</i>	Bacteria Rickettsia	Human Q Fever	63°C/145°F	30 minutes	Health Canada, 2007
<i>Alternaria alternata</i>	Fungi	Human	63°C/145°F	25 minutes	Domsch, 1993; Page 37
<i>Aspergillus fumigatus</i>	Fungi	Human	65°C/149°F	30 minutes	Bollen, 1969
<i>Aspergillus niger</i>	Fungi	Human	63°C/145°F	25 minutes	Domsch, 1993; Page 102
<i>Aspergillus ustus</i>	Fungi	Human	62°C/144°F	25 minutes	Domsch, 1993; Page 119
<i>Candida albicans</i>	Fungi/Yeast	Human	70°C/158°F	60 minutes	Wiley & Westerberg (1969)
<i>Candida lipolytica</i>	Fungi/Yeast	Human	63°C/145°F	15 minutes	Dumalisile, et al., 2005
<i>Chaetomium spp.</i> (Soft rot)	Fungi	Human	55°C/131°F	30 minutes	Bollen, 1969
<i>Chaetomium globosum</i>	Fungi	Human, Structure	57°C/135°F	10 minutes	Domsch, 1993
<i>Cladosporium herbarum</i>	Fungi	Human	50°C/122°F	10 minutes	Ridley and Crabtree, 2001
<i>Cladosporium herbarum</i>	Fungi	Human	60°C/140°F	30 minutes	Bollen, 1969
<i>Fusarium cinctatum</i>	Fungi	Human, Plant	60°C/140°F	10 minutes	Ridley, G. unpublished data
<i>Fusarium oxysporum</i>	Fungi	Human	60°C/140°F	30 minutes	Bollen, 1969
<i>Fusarium redolens</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
<i>Lasiodiplodia theobromae</i> formerly <i>Botryodiplodia theobromae</i>	Fungi	Plant, Human	60°C/140°F	10 minutes	Ridley and Crabtree, 2001
<i>Histoplasma capsulatum</i>	Dimorphic Fungi	Human			
<i>Myrothecium verrucaria</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
Oömycetes	Fungi	Plant, Human	50°C/122°F	30 minutes	Bollen, 1969

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<i>Penicillium corylophilum</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
<i>Penicillium funiculosum</i>	Fungi	Human	70°C/158°F	30 minutes	Bollen, 1969
<i>Peniophora spp.</i>	Fungi	Plant	54.4°C/130°F	15 minutes	Morrell, 1990
<i>Penicillium lapidosum</i>	Fungi	Plant	70°C/158°F	30 minutes	Bollen, 1969
<i>Phialaphora mustea</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
<i>Phoma herbarum</i>	Fungi	Human	75°C/167°F	30 minutes	Bollen, 1969
<i>Poria carbonica</i>	Fungi	Plant	60°C/140°F 70°C/158°F	3 hours 60 minutes	Morrell, 1987
<i>Poria placenta</i>	Fungi	Plant	60°C/140°F 65.5°C/150°F	6 hours 3 hours	Morrell, 1987
<i>Preussia fleischhაკii</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
<i>Rhinocladiella mansonii</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
<i>Serpula lacrymans</i> (Dry rot)	Fungi	Structure	45°C/113°F 50°C/122°F	3 hours 1 hour	Miric & Willeitner (1984)
<i>Sordaria carbonaria</i>	Fungi	Plant	65°C/149°F	30 minutes	Bollen, 1969
<i>Sordaria spp.</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
<i>Sporormia aemulans</i>	Fungi	Plant	65°C/149°F	30 minutes	Bollen, 1969
<i>Stachybotrys atra</i> ( <i>S. chartarum</i> )	Fungi	Human	60°C/140°F	30 minutes	Bollen, 1969
<i>Stachybotrys chartarum</i>	Fungi	Human	60°C/140°F	30 minutes	Domsch, 1993; Page 745
<i>Stereum sanguinolentum</i>	Fungi	Plant	54.4°C/130°F	15 minutes	Morrell, 1990
<i>Stemphylium botryosum</i>	Fungi	Plant	60°C/140°F	30 minutes	Bollen, 1969
<i>Trichocladium piriformis</i>	Fungi	Plant	80°C/176°F	30 minutes	Bollen, 1969
<i>Trichoderma lignorum</i>	Fungi	Plant, some Human	55°C/131°F	30 minutes	Bollen, 1969
<i>Zygorhynchus moelleri</i>	Fungi	Plant	55°C/131°F	30 minutes	Bollen, 1969
<i>Ascaris lumbricoides</i>	Helminths	Human	55°C/131°F	60 minutes	Feachem, 1983
<i>Ascaris lumbricoides</i> eggs	Helminths	Human	50°C/122°F 55°C/131°F	60 minutes 7 minutes	Jones & Martin, 2003; Stern, 1974

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<i>Necator americanus</i>	Helminths	Human	50°C/122°F	50 minutes	Jones & Martin, 2003; Stern, 1974
<i>Opisthorchis</i> spp.	Helminths	Human	56°C/133°F	30 minutes	Health Canada, 2007
Schistosoma eggs	Helminths	Human	50°C/122°F	60 minutes	Feachem, 1983
<i>Taenia saginata</i>	Helminths	Human	71°C/160°F	5 minutes	Jones & Martin, 2003; Golueke, 1982
<i>Taenia saginata</i>	Helminths	Human	71°C/160°F	5 minutes	Jones & Martin, 2003; Golueke, 1982
<i>Taenia saginata</i>	Helminths	Human	70°C/158°F	5 minutes	Jones & Martin, 2003; Stern, 1974
<i>Trichinella spiralis</i>	Helminths	Human	72°C/162°F	60 minutes	Jones & Martin, 2003; Golueke, 1982
<i>Agrilus planipennis</i> Emerald ash borer	Pests	Plant	71°C/160°F	75 minutes	APHIS Factsheet, 2009
<i>Anoplophora glabripennis</i> Asian longhorned beetle	Pests	Plant	71°C/160°F	75 minutes	APHIS Factsheet, 2009
<i>Blatella germanica</i> , German cockroach	Pests	Vector	54.4°C/130°F	7 minutes	Quarles, 2006; Forbes, Ebeling, 1987
<i>Cimex lectularius</i> , Bed Bug	Pests	Human	39-40°C/ 111-113°F		Getty, 2006; Usinger, 1966
<i>Cimex lectularius</i> , Bed Bug - Adults and nymphs	Pests	Human	>40°C/113°F	15 minutes	Getty, 2006; Gulmahamad, 2002
<i>Cimex lectularius</i> , Bed Bug Eggs	Pests	Human	>40°C/113°F	1 hour	Getty, 2006; Gulmahamad, 2002
<i>Cimex lectularius</i> , Bed Bug - Adults	Pests	Human	45°C/113°F 48°C/118°F 50°C/122°F	90 minutes 2 minutes 0 minutes	Hulasare, 2010
<i>Cimex lectularius</i> , Bed Bug Eggs	Pests	Human	45°C/113°F 48°C/118°F 50°C/122°F	8 hours 90 minutes 0 minutes	Hulasare, 2010
<i>Dermanyssus gallinae</i> , Chicken Mite or Poultry Red Mite	Pests	Vector Human Avian	45°C/113°F	2 hours	Nordenfors, 1999
<i>Dermatophagoides farinae</i> Am. Dust Mite	Pests	Human	60°C/140°F	60 minutes	Ogg, 1997

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<i>Dermatophagoides farinae</i> Am. Dust Mite	Pests	Human	45°C/113°F 50°C/122°F 60 °C/140°F 70 °C/158°F	200 minutes 30 minutes 8 minutes 4 minutes	Chang, 1998
<i>Dermatophagoides pteronyssinus</i> Eur. Dust Mite	Pests	Human	60°C/140°F 50°C/122°F	60 minutes 30 minutes	Ogg, 1997 Mahakittikun, 2001
<i>Incisitermes minor</i> , Western Drywood Termite	Pests	Damage - Structural	54.4°C/130°F	6 minutes	Quarles, 2006; Forbes, Ebeling, 1987
<i>Lepisma saccharina</i> Silverfish - Nymphs	Pests	Damage – Books	40°C/104°F	“A few hours”	Sweetman, 1939
<i>Lepisma saccharina</i> Silverfish - Adults	Pests	Damage – Books	>32°C/90°F	“A few hours”	Sweetman, 1939
<i>Lithepuhema humile</i> , Argentine Ant	Pests	Damage - Structural	54.4°C/130°F	1 minute	Quarles, 2006; Forbes, Ebeling, 1987
<i>Lyctus</i> Powder Post Beetle All Forms	Pests	Damage - Structural	54.4°C/130°F	2 1/2 hours	Parkin, 1937; Fisher, 1928
<i>Lyctus</i> Powder Post Beetle Larvae	Pests	Damage - Structural	52°C/125°F	2-4 hours	Parkin, 1937
<i>Pediculus humanus</i> , Human Body Louse	Pests	Vector	46.6°C/116°F	1 hour	Mellanby, 1932
<i>Tetropium fuscum</i> Brown Spruce Longhorn Beetle Larvae	Pests	Damage-Structural	50°C/122°F 55°C/131°F	30 minutes 15 minutes	Mushrow, 2004
<i>Thermobia domestica</i> Firebrat	Pests	Damage – Books	55°C/131°F	5 minutes	Sweetman, 1938
<i>Tineola bisselliella</i> Webbing Clothes Moth	Pests	Damage-Textiles	48.9°C/120°F	30 minutes	Rust, 2000

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<i>Tineola bisselliella</i> (All Stages) Webbing Clothes Moth	Pests	Damage-Textiles	41°C/106°F	4 hours	Rawle, 1951
<i>Tinibrio molitor</i> Yellow Mealworm	Pests	Damage - Food	42.8°C/109°F	1 hour	Mellanby, 1932
<i>Triboltum confusum</i> , Adult Flour Beetle	Pests	Damage - Food	54.4°C/130°F	4 minutes	Quarles, 2006; Forbes, Ebeling, 1987
<i>Xenopsylla cheopis</i> , Rat Flea Larvae	Pests	Vector	39.4°C/103°F	1 hour	Mellanby, 1932
<i>Xenopsylla cheopis</i> , Rat Flea Adult	Pests	Vector	40.6°C/105°F	1 hour	Mellanby, 1932
<i>Cryptosporidium parva</i>	Protozoa	Human	72.4°C/ 162.3°F	1 minute	Gerba, 1997; Fayer, 1994
<i>Entamoeba histolytica</i>	Protozoa	Human	60°C/140°F	1 minute	Feachem, 1983
<i>Entamoeba histolytica</i>	Protozoa	Human	60°C/140°F	1 minute	Gerba, 1997; Chang, 1943
<i>Entamoeba histolytica</i> cysts	Protozoa	Human	50°C/122°F	5 minutes	Jones & Martin, 2003; Stern, 1974
<i>Giardia lamblia</i>	Protozoa	Human	60°C/140°F	2-3 minutes	Univ of Utah, 2005
<i>Giardia Lamblia</i>	Protozoa	Human	50°C/122°F	1 minute**	Gerba, 1997; Cerva, 1955
<i>Toxoplasma gondii</i> Oocysts	Protozoa	Human	>66°C/151°F	10 minutes	Health Canada, 2007
<i>Trypanosoma cruzi</i>	Protozoa	Human, Avian	45°C/113°F	60 minutes	Von Brand, 1946
Adenovirus	Virus	Human	60°C/140°F	20 minutes	Gerba, 1997; Mahnel, 1977
Avian pneumovirus	Virus	Avian	56°C/133°F	30 minutes	TIP, 2000; Collins, 1986
Cercopithecine Herpes Virus 1	Virus	Human Animal	60°C/140°F	30 minutes	Health Canada, 2007
Coronavirus	Virus	Human	55°C/131°F	2 minutes	Gerba, 1997; Laude, 1981
Coxsackievirus	Virus	Human	60°C/140°F	30 minutes	Health Canada, 2007
Cytomegalovirus	Virus	Human	60°C/140°F	30 minutes	Health Canada, 2007
Ebola virus	Virus	Human	60°C/140°F	60 minutes	Health Canada, 2007



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Echovirus	Virus	Human	50°C/122°F	2 hours	Health Canada, 2007
Enterovirus 70	Virus	Human	60°C/140°F	30 minutes	Health Canada, 2007
Enteroviruses, Reoviruses and Adenoviruses (All)	Virus	Human	60°C/140°F	2 hours	Feachem, 1983
Epstein-Barr Virus	Virus	Human	60°C/140°F	30 minutes	Health Canada, 2007
Hantavirus Pulmonary Syndrome (HPS)	Virus	Human	60°C/140°F	30 minutes	Health Canada, 2007
Hepatitis A	Virus	Human	70°C/158°F	10 minutes	Gerba, 1997; Siegl et al., 1984
Hepatitis A	Virus	Human	70°C/158°F	4 minutes	Health Canada, 2007
Highly Pathogenic Avian Influenza (HPAI)	Virus	Human, Avian	56°C/133°F	15 minutes	TIP, 2000; Blaha, 1989
Infectious bronchitis	Virus	Human, Avian	56°C/133°F	15 minutes	Otsaki, 1979
Newcastle Disease Virus (NDV)	Virus	Human, Avian	60°C/140°F 70°C/158°F	1 hour 50 seconds	TIP, 2000; Foster & Thompson, 1957
Norwalk virus	Virus	Human	>60°C/140°F	>30 minutes	Health Canada, 2007
Parvoviruses	Virus	Human, Avian	60°C/140°F	30 minutes	TIP, 2000; Gough et al., 1981
Poliovirus	Virus	Human	60°C/140°F	25 minutes	Gerba, 1997; Larkin and Fasolitis, 1979
Poliovirus 1	Virus	Human	55°C/131°F 60°C/140°F	30 minutes 5 minutes	Feachem, 1983, p163; Wiley & Westerberg, 1969
Poxviruses	Virus	Human, Avian	60°C/140°F	8 minutes	TIP, 2000; Tripathy, 1993
Reovirus	Virus	Human	60°C/140°F	20 minutes	Gerba, 1997; Mahnel, 1977
Rotavirus	Virus	Human	63°C/145°F	30 minutes	Feachem, 1983, p188; G.N. Woode
Rotavirus	Virus	Human	50°C/122°F	30 minutes	Gerba, 1997 ; Estes, et al., 1979
Viruses (Most)	Virus	Human	70°C/158°F	20 minutes	Jones & Martin, 2003; Day & Shaw, 2000
Viruses (Most)	Virus	Human	70°C/158°F	25 minutes	Jones & Martin, 2003; Stern, 1974

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<i>Acinetobacter baumannii</i>	Bacteria	Human	63°C/145°F	15 minutes	Dumalisile, et al., 2005
<i>Aeromonas hydrophila</i>	Bacteria	Human	50°C/122°F	3 minutes**	Gerba, 1997; Gordon et al., 1992
<i>Bacillus anthracis</i>	Bacteria	Human	140°C/284°F	3 hours	Hampil, 1932; Koch, 1881
<i>Bacillus coli (E. coli)</i>	Bacteria	Human	60°C/140°F	10 minutes	Hampil, 1932; Loeffler, 1886
<i>Bacillus pestis (Yersinia)</i>	Bacteria	Human	60°C/140°F	2 minutes	Hampil, 1932; Gladin, 1898
<i>Bacillus typhosus (Salmonella)</i>	Bacteria	Human	56°C/133°F	10 minutes	Hampil, 1932; Sternburg, 1887
			63°C/145°F	4 minutes	Hampil, 1932; Orskov, 1926
<i>Bacterium tularensis</i>	Bacteria	Human	56°C/133°F	10 minutes	Hampil, 1932; McCoy, 1912
<i>Brucella abortus</i>	Bacteria	Human	61°C/142°F	3 minutes	Jones & Martin, 2003; Golueke, 1982
<i>Brucella abortus</i>	Bacteria	Human	55°C/130°F	60 minutes	Jones & Martin, 2003; Stern, 1974
<i>Brucella abortus or suis</i>	Bacteria	Human	65°C/149°F	3 minutes	
			55°C/130°F	60 minutes	Jones & Martin, 2003; Day & Shaw, 2000
			60°C/140°F	3 minutes	