

Appendix 7:
Contamination Data sets

Smoked Seafood Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Aguado <i>et al.</i> , 2001	Salmon, smoked	1	Spain	3	R	52	36	16																								
Baek <i>et al.</i> , 2000	Mussels, frozen & smoked	1	Korea	3	R	68	65	3																								
Cortesi <i>et al.</i> , 1997	Salmon, smoked	1	Italy	2	P	100	80	8					11														1					
Cortesi <i>et al.</i> , 1997	Salmon, smoked	1	Italy	2	P	65	53	6					2		2					1							1					
Dauphin <i>et al.</i> , 2001	Coalfish, smoked	1	France	3	P	1	0	1																								
Dauphin <i>et al.</i> , 2001	Salmon, fresh & smoked	1	France	3	P	11	0	11																								
Dauphin <i>et al.</i> , 2001	Salmon Skin, smoked	1	France	3	P	2	1	E ⁴							1																	
Dauphin <i>et al.</i> , 2001	Salmon, smoked	1	France	3	P	21	19	2																								
Dauphin <i>et al.</i> , 2001	Tuna, smoked	1	France	3	P	1	0	1																								
Dillon <i>et al.</i> , 1994	Fin-fish, hot/cold-smoked	1	Canada	2	?	258	246	12																								
Dominguez <i>et al.</i> , 2001	Salmon, cold-smoked	1	Spain	3	R	170	132	E									18		18								2					
Eklund <i>et al.</i> , 1995	Salmon, cold-smoked	1	USA	2	P	61	13	E									48															
Ericsson <i>et al.</i> , 1997	Trout, smoked	1	Sweden	2	P&R	9	6	E									3															
Farber, 1991b	Salmon, cold-smoked	1	Canada/ etc	1	P	32	22	10																								
Garland, 1995	Salmon, cold-smoked	1	Australia	2	P	285	284	1																								
Guyer and Jemmi, 1990	Salmon, cold-smoked	1	Switzer- land	1	P	64	60	4																								
Hartemink and Georgsson, 1991	Fish, smoked	1	Iceland	1	P/R	31	30	1																								
Heinitz and Johnson, 1998	Fish, smoked	1	USA	1	P	1080	929	151																								

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Hudson <i>et al.</i> , 1992	Mussels, smoked	1	New Zealand	1	R	14	9	5																								
Hudson <i>et al.</i> , 1992	Salmon, smoked	1	New Zealand	1	R	12	4	8																								
Inoue <i>et al.</i> , 2000	Salmon, smoked	1	Japan	3	R	92	87	E		4		1																				
Jemmi, 1990	Fin-fish, cold-smoked	1	Switzerland	1	R	324	280	44																								
Jemmi, 1990	Fin-fish, hot-smoked	1	Switzerland	1	R	496	452	44																								
Jørgensen and Huss, 1998	Halibut, cold-smoked	1	Denmark	2	P	20	11	E				9																				
Jørgensen and Huss, 1998	Halibut, cold-smoked	1	Denmark	2	P	20	8	E				6		2						3					1							
Jørgensen and Huss, 1998	Salmon, cold-smoked	1	Denmark	2	P	190	126	E				53		9						2												
Jørgensen and Huss, 1998	Salmon, cold-smoked	1	Denmark	2	P	115	69	E				11		23						10					2							
Jørgensen and Huss, 1998	Salmon, cold-smoked	1	Denmark	2	P	75	43	E				17		11						2					2							
Hatakka <i>et al.</i> , 2001	Smoked, cold & vacuum-packed	1	Finland	3	R	232	222	E									10															
Miettinen, H., <i>et al.</i> , 2001	Fish, cold-smoked	1	Finland	3	P	12	10	2																								
Miettinen, H., <i>et al.</i> , 2001	Fish, hot-smoked	1	Finland	3	P	13	12	1																								
NFPA, 2002	Seafood, smoked	1	USA-CA	3	R	1363	1292	E	44	5		11		5						4							1				1	
NFPA, 2002	Seafood, smoked	1	USA-MD	3	R	1324	1281	E	23	6		8		3						2											1	
Ng and Seah, 1995	Mussels, smoked	1	Singapore	2	R	2	1	1																								
Norton <i>et al.</i> , 2000	Fish, cold-smoked	1	USA	3	P	38	32	6																								
Norton <i>et al.</i> , 2001	Fish, cold-smoked	1	USA	3	P	96	85	11																								
Oregon State Dept of Agriculture, 2001	Cod, smoked	1	USA	3	R	5	5	0																								

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Oregon State Dept of Agriculture, 2001	Halibut, smoked	1	USA	3	R	3	3	0																								
Oregon State Dept of Agriculture, 2001	Oysters, smoked	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Salmon, smoked	1	USA	3	R	130	129	1																								
Oregon State Dept of Agriculture, 2001	Seafood, smoked	1	USA	3	R	4	4	0																								
Oregon State Dept of Agriculture, 2001	Shad, smoked	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Snapper, smoked	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Sockeye, smoked	1	USA	3	R	3	3	0																								
Oregon State Dept of Agriculture, 2001	Sturgeon, smoked	1	USA	3	R	10	10	0																								
Oregon State Dept of Agriculture, 2001	Trout, smoked	1	USA	3	R	7	7	0																								
Scoglio <i>et al.</i> , 2000	Salmon, smoked	1	Italy	3	R	21	18	3																								
Teufel and Bendzulla, 1993	Fish, smoked	1	Germany	1	R?	71	66	5																								
Teufel and Bendzulla, 1993	Fish, smoked	1	Germany	1	R?	309	287	E									14			4							4					
Vogel <i>et al.</i> , 2001a	Salmon, cold-smoked	1	Denmark	3	P	324	231	93																								
Vogel <i>et al.</i> , 2001b	Salmon, cold-smoked	1	Denmark	3	P	200	65	135																								
Yamazaki <i>et al.</i> , 2000	Herring, smoked	1	Japan	3	R	1	0	1																								

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Yamazaki <i>et al.</i> , 2000	Salmon, smoked	1	Japan	3	R	12	10	2																								
Total=						7855	6844	589	67	11	4		129		56			93		42	4					5	5	4			2	

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

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Adesiyun, 1993	Fish & shrimp, raw	2	Trinidad	1	R	102	100	2																								
Anderson and Nørnung, 1995	Fish, raw	1	Denmark	2	R	232	199	E ⁴					26		6				1													
Baek <i>et al.</i> , 2000	Halibut, raw	1	Korea	3	R	45	45	0																								
Baek <i>et al.</i> , 2000	Shellfish	1	Korea	3	R	250	247	3																								
Berry <i>et al.</i> , 1994	Shrimp, imported & frozen	1	USA	2	R	30	28	2																								
Buchanan <i>et al.</i> , 1989	Catfish, fresh	1	USA	1	R	1	1	0																								
Buchanan <i>et al.</i> , 1989	Clam, raw	1	USA	1	R	1	1	0																								
Buchanan <i>et al.</i> , 1989	Fin-fish, fresh	1	USA	1	R	4	2	2																								
Buchanan <i>et al.</i> , 1989	Oysters, uncooked	1	USA	1	R	2	2	0																								
Buchanan <i>et al.</i> , 1989	Scallops, raw	1	USA	1	R	1	1	0																								
Buchanan <i>et al.</i> , 1989	Shrimp, raw & frozen	1	USA	1	R	4	4	0																								
Buchanan <i>et al.</i> , 1989	Surimi, crab	1	USA	1	R	1	1	0																								
Colburn <i>et al.</i> , 1990	Oysters, live	1	USA	1	P	35	35	0																								
Dauphin <i>et al.</i> , 2001	Fillet, coalfish	1	France	3	P	2	0	2																								
Dauphin <i>et al.</i> , 2001	Fillet, cod	1	France	3	P	4	0	4																								
Dauphin <i>et al.</i> , 2001	Salmon, cut & raw	1	France	3	P	1	0	1																								
Dauphin <i>et al.</i> , 2001	Herring, frozen	1	France	3	P	5	0	5																								
Dauphin <i>et al.</i> , 2001	Surfaces, raw salmon (filets)	1	France	3	P	8	1	7																								

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Dauphin <i>et al.</i> , 2001	Surfaces, raw salmon (whole)	1	France	3	P	7	1	6																								
Dauphin <i>et al.</i> , 2001	Surfaces, raw salmon	1	France	3	P	18	16	2																								
Davies <i>et al.</i> 2001	Plaice/raw food	1	Great Britain	3	R	5	5	0																								
Davies <i>et al.</i> 2001	Salmon/raw seafood	1	Great Britain	3	R	5	5	0																								
Davies <i>et al.</i> 2001	Sardine/raw seafood	1	Portugal	3	R	10	10	0																								
Davies <i>et al.</i> 2001	Trout/raw seafood	1	Great Britain	3	R	20	18	2																								
Davies <i>et al.</i> 2001	Trout/raw seafood	1	Portugal	3	R	10	10	0																								
Davies <i>et al.</i> 2001	Whiting/raw seafood	1	France	3	R	26	26	0																								
de Simon <i>et al.</i> , 1992	Molluscs, bivalve, mussels	1	Spain	1	R	40	37	3																								
Decastelli <i>et al.</i> , 1993	Mussels, depurated	1	Italy	1	P	110	110	0																								
Decastelli <i>et al.</i> , 1993	Mussels,	1	Italy	1	P	175	175	0																								
Degnan <i>et al.</i> , 1994	Meat, blue crab	1	Australia	2	R	4	3	1																								
Draughon <i>et al.</i> , 1999	Trout, rainbow	1	USA	3	R	74	36	E								30	8															
El-Shenawy and El-Shenawy, 1995	Clam, fresh	2	Egypt	2	R	4	3	1																								
El-Shenawy and El-Shenawy, 1995	Coquina, fresh	2	Egypt	2	R	6	5	1																								
El-Shenawy and El-Shenawy, 1995	Crab	2	Egypt	2	R	5	5	0																								
El-Shenawy and El-Shenawy, 1995	Fin-fish, fresh	2	Egypt	2	R	39	34	5																								
El-Shenawy and El-Shenawy, 1995	Fin-fish, frozen	2	Egypt	2	R	17	16	1																								

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El-Shenawy and El-Shenawy, 1995	Oysters, raw	2	Egypt	2	R	2	2	0																								
El-Shenawy and El-Shenawy, 1995	Shrimp	2	Egypt	2	R	5	4	1																								
Farber, 1991b	Shrimp, retail	1	Canada	1	R	20	16	4																								
Farber, 1991b	Surimi, etc	1	Canada	1	R	46	45	1																								
Ferrer and de Simón, 1993	Mussels, fresh	1	Spain	1	R	35	32	3																								
Ferrer and de Simón, 1993	Oysters, fresh	1	Spain	1	R	40	39	1																								
Fuchs and Surendran, 1989	Clam, raw	1	India	1	R	1	1	0																								
Fuchs and Surendran, 1989	Fish, fresh	2	India	1	R	9	9	0																								
Fuchs and Surendran, 1989	Fish, frozen	2	India	1	R	14	14	0																								
Hartemink and Georgsson, 1991	Fish, other	1	Iceland	1	P or R	5	4	1																								
Hartemink and Georgsson, 1991	Trout, fresh	1	Iceland	1	P or R	2	2	0																								
Heinitz, 1999	Fin-fish/shellfish	1	USA	3	P	9495	8791	704																								
Hofer and Ribeiro, 1990	Shrimp, frozen	1	Brazil	1	P	45	41	4																								
Hudson <i>et al.</i> , 1992	Ready-to-eat seafood	1	New Zealand	1	R	50	37	13																								
Iida <i>et al.</i> , 1998	Fin-fish & non-fin-fish	1	Japan	2	R	781	771	10																								
Inoue <i>et al.</i> , 2000	Seafood, raw	1	Japan	3	R	213	206	E			1	1	2		2				1													
Jeyasekaran <i>et al.</i> , 1996	Fin-fish, tropical	2	India	2	P or R	29	24	5																								
Jeyasekaran <i>et al.</i> , 1996	Shellfish, tropical	1	India	2	P or R	36	32	4																								
Kamat and Nair, 1994	Anchovy	2	India	2	R	2	2	0																								
Kamat and Nair, 1994	Duck-fish, Bombay	2	India	2	R	2	2	0																								

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Kamat and Nair, 1994	Crab	1	India	2	R	2	2	0																								
Kamat and Nair, 1994	Fish, Doma-local	2	India	2	R	3	3	0																								
Kamat and Nair, 1994	Anchovy, Golden	2	India	2	R	2	2	0																								
Kamat and Nair, 1994	Salmon, Indian	2	India	2	R	1	1	0																								
Kamat and Nair, 1994	Mackeral	2	India	2	R	3	3	0																								
Kamat and Nair, 1994	Pom fret	2	India	2	R	2	2	0																								
Kamat and Nair, 1994	Shrimp, raw	1	India	2	R	5	5	0																								
Kamat and Nair, 1994	Fin, thread	2	India	2	R	3	3	0																								
Karpiskova <i>et al.</i> , 2000	Fish, raw	1	Czech Republic	3	R	120	118	2																								
Karunasagar <i>et al.</i> , 1992	Fish	2	India	1	P	200	200	0																								
Manoj <i>et al.</i> , 1991	Fin-fish, fresh	2	India	1	P or R	51	51	0																								
Manoj <i>et al.</i> , 1991	Shrimp, raw/process	1	India	1	P or R	19	19	0																								
Masuda <i>et al.</i> , 1992	Fin-fish, fresh	1	Japan	1	R	382	373	9																								
Masuda <i>et al.</i> , 1992	Shellfish, non-oyster	1	Japan	1	R	147	145	2																								
Masuda <i>et al.</i> , 1992	Oysters, raw	1	Japan	1	R	84	84	0																								
McLauchlin and Gilbert, 1990	Fish & fish products	1	UK	1	?	46	29	17																								
Miettinen <i>et al.</i> , 2001	Fish, raw	1	Finland	3	P	18	16	2																								
Miettinen <i>et al.</i> , 2001	Roe	1	Finland	3	P	5	5	0																								
Monfort <i>et al.</i> , 1998	Shellfish	1	France	1	P	120	109	11																								
Motes, 1991	Oysters, live	1	USA	1	P	75	75	0																								
Motes, 1991	Shrimp, live	1	USA	1	P	74	66	8																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Ng and Seah, 1995	Crabmeat/scallops	1	Singapore	2	P or R	16	16	0																								
Ng and Seah, 1995	Fish cakes, fingers	2	Singapore	2	P or R	16	13	3																								
Ng and Seah, 1995	Tuna	2	Singapore	2	P or R	5	5	0																								
Norton <i>et al.</i> , 2000	Fish, raw	1	USA	3	P	43	40	3																								
Norton <i>et al.</i> , 2001	Fish, raw	1	USA	3	P	102	93	9																								
Oregon State Dept of Agriculture, 2001	Butterfish	1	USA	3	R	6	6	0																								
Oregon State Dept of Agriculture, 2001	Cod	1	USA	3	R	40	22	18																								
Oregon State Dept of Agriculture, 2001	Crab	1	USA	3	R	393	375	18																								
Oregon State Dept of Agriculture, 2001	Halibut	1	USA	3	R	6	0	6																								
Oregon State Dept of Agriculture, 2001	Fillets, ocean cats	1	USA	3	R	6	6	0																								
Oregon State Dept of Agriculture, 2001	Perch	1	USA	3	R	17	17	0																								
Oregon State Dept of Agriculture, 2001	Seafood, raw	1	USA	3	R	40	28	12																								
Oregon State Dept of Agriculture, 2001	Surimi, raw	1	USA	3	R	3	2	1																								
Oregon State Dept of Agriculture, 2001	Fish, rock	1	USA	3	R	29	22	7																								
Oregon State Dept of Agriculture, 2001	Roe	1	USA	3	R	8	8	0																								
Oregon State Dept of Agriculture, 2001	Sable	1	USA	3	R	6	6	0																								

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Oregon State Dept of Agriculture, 2001	Salmon	1	USA	3	R	8	8	0																								
Oregon State Dept of Agriculture, 2001	Shrimp	1	USA	3	R	106	99	7																								
Oregon State Dept of Agriculture, 2001	Snapper	1	USA	3	R	12	12	0																								
Oregon State Dept of Agriculture, 2001	Sole	1	USA	3	R	54	35	19																								
Oregon State Dept of Agriculture, 2001	Sushi-with & without rice	1	USA	3	R	42	41	1																								
Oregon State Dept of Agriculture, 2001	Filletts, turbot	1	USA	3	R	6	6	0																								
Pullela <i>et al.</i> , 1998	Fin-fish, aquaculture	1	USA	1	P	140	140	0																								
Ravomanana <i>et al.</i> , 1993	Shrimp, raw & fresh	1	France	1	R?	17	15	2																								
Rorvik and Yndestad, 1991	Fin-fish, minced	1	Norway	1	P	8	7	1																								
Ryu <i>et al.</i> , 1992	Fish, other	1	Japan	1	R	6	6	0																								
Ryu <i>et al.</i> , 1992	Fish, salt sushi	1	Japan	1	R	10	10	0																								
Ryu <i>et al.</i> , 1992	Fish, sushi	1	Japan	1	R	18	15	3																								
Ryu <i>et al.</i> , 1992	Prawn, raw, 'sushi'	1	Japan	1	R	38	37	1																								
Ryu <i>et al.</i> , 1992	Tuna, minced sushi	1	Japan	1	R	37	34	3																								
Scoglio <i>et al.</i> , 2000	Shellfish, raw	1	Italy	3	R	23	23	0																								
Scoglio <i>et al.</i> , 2000	Shrimp, raw	1	Italy	3	R	17	17	0																								
Soriano <i>et al.</i> , 2001	Hake, raw	1	Spain	3	R	4	4	0																								
Soriano <i>et al.</i> , 2001	Salmon, raw	1	Spain	3	R	4	4	0																								
Soriano <i>et al.</i> , 2001	Sole, raw	1	Spain	3	R	6	6	0																								

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Teufel and Bendzulla, 1993	Crustacean/s hellfish	1	Germany	1	R?	32	32	E																								
Teufel and Bendzulla, 1993	Crustacean/s hellfish	1	Germany	1	R?	80	80	0																								
Teufel and Bendzulla, 1993	Fish & fish parts	1	Germany	1	R?	35	33	E										1			1											
Teufel and Bendzulla, 1993	Fish & fish parts	1	Germany	1	R?	238	232	6																								
Vogel <i>et al.</i> , 2001a	Salmon, raw	1	Denmark	3	P	92	90	2																								
Weagant <i>et al.</i> , 1988	Fin-fish, frozen	1	USA	1	R or P	40	39	1																								
Weagant <i>et al.</i> , 1988	Lobster tail, frozen	1	USA	1	R or P	20	19	1																								
Weagant <i>et al.</i> , 1988	Oysters, frozen	1	USA	1	R or P	10	10	0																								
Weagant <i>et al.</i> , 1988	Scallops, frozen	1	USA	1	R or P	18	18	0																								
Weagant <i>et al.</i> , 1988	Shrimp, raw & frozen	1	USA	1	R or P	70	60	10																								
Weagant <i>et al.</i> , 1988	Squid, langostinos, frozen	1	USA	1	R or P	20	20	0																								
Weagant <i>et al.</i> , 1988	Surimi, frozen	1	USA	1	R or P	66	46	20																								
Wong <i>et al.</i> , 1990	Fish & non-fish, local frozen and refrigerated	2	Taiwan	1	R	57	51	6																								
Yamazaki <i>et al.</i> , 2000	Finfish, raw	1	Japan	3	R	10	10	0																								
Yamazaki <i>et al.</i> , 2000	Octopus, raw, squid, trepang	1	Japan	3	R	7	7	0																								
Yamazaki <i>et al.</i> , 2000	Salmon, raw	1	Japan	3	R	12	11	1																								
Yamazaki <i>et al.</i> , 2000	Shellfish, raw	1	Japan	3	R	10	10	0																								
Yamazaki <i>et al.</i> , 2000	Shrimp, raw	1	Japan	3	R	10	10	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Yamazaki <i>et al.</i> , 2000	Seafood, surimi and minced	1	Japan	3	R	10	10	0																								
Yamazaki <i>et al.</i> , 2000	Seafood,	1	Japan	3	R	8	8	0																								
Total=						15634	14541	1013			1	1	28		8	30	8	1	2		1											

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Preserved Fish Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Anderson and Nørnung, 1995	Fish, preserved	1	Denmark	2	R	335	300	E ⁴					18		11				6													
Baek <i>et al.</i> , 2000	Dried shrimp, squid & mussels	1	Korea	3	R	12	12	0																								
Choi <i>et al.</i> ,2001	Dried squid & mussels	1	Korea	3	R	20	20	0																								
El-Shenawy and El-Shenawy, 1995	Fin-fish, smoke & salted	2	Egypt	2	R	11	10	1																								
Ericsson et al, 1997	Trout, gravad	1	Sweden	2	P/R	8	3	E									3		1													1
Fuchs and Sirvas, 1991	Ceviche	1	Peru	1	R	32	29	3																								
Fuchs and Surendran, 1989	Fish, dried & salted	2	India	1	R	11	11	0																								
Hartemink and Georgsson, 1991	Gravad	1	Iceland	1	P or R	23	17	6																								
Hartemink and Georgsson, 1991	Haddock, dried	1	Iceland	1	P or R	5	5	0																								
Jemmi, 1990	Fin-fish, pickled	1	Switzer-land	1	R	89	66	23																								
Jorgensen and Huss, 1998	Fish, gravad	1	Denmark	2	P	91	68	E					5		10					5						3						
Kamat and Nair, 1994	Anchovy, dried	2	India	2	R	3	3	0																								
Kamat and Nair, 1994	Anchovy, Golden dried	2	India	2	R	2	2	0																								
Kamat and Nair, 1994	Dried fish “Bombay Duck”	2	India	2	R	3	3	0																								
Kamat and Nair, 1994	Mackeral, dried	2	India	2	R	2	2	0																								
Kamat and Nair, 1994	Shrimp, dried	1	India	2	R	3	3	0																								
Loncarevic <i>et al</i> , 1996	Fish, gravad	1	Sweden	2	R	58	46	12																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Hatakka <i>et al</i> , 2001	Fish, cold-salted & vacuum-packed	1	Finland	3	R	82	77	E										5														
McLauchlin & Gilbert, 1990	Cooked fish & fish products	1	UK	1	?	346	334	12																								
Miettinen <i>et al</i> , 2001	Fish, cold & salted	1	Finland	3	P	10	8	2																								
Oregon State Dept of Agriculture, 2001	Clams, salted		USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Salmon, salted	1	USA	3	R	4	4	0																								
Oregon State Dept of Agriculture, 2001	Anchovies, seasoned	1	USA	3	R	1	1	0																								
Rorvik and Yndestad, 1991	Shrimp, brined	1	Norway	1	P	16	13	3																								
Teufel and Bendzulla, 1993	Fish, processed	1	Germany	1	R?	186	185	E										1														
Teufel and Bendzulla, 1993	Fish, processed	1	Germany	1	R?	119	106	13																								
Yamazaki <i>et al</i> , 2000	Dried squid, salmon, shishamo smelt	1	Japan	3	R	4	4	0																								
Yamazaki <i>et al</i> , 2000	Seafood, fermented	1	Japan	3	R	7	7	0																								
Yamazaki <i>et al</i> , 2000	Sushi flatfish, fermented	1	Japan	3	R	1	0	1																								
Yamazaki <i>et al</i> , 2000	Salad, marinated seafood	1	Japan	3	R	8	8	0																								
Yamazaki <i>et al</i> , 2000	Sushi sandfish, fermented	1	Japan	3	R	1	0	1																								
Total=						1495	1349	77					23		21			9	6	6						3						1

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⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Ready-to-eat Crustacean Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Dauphin <i>et al</i> , 2001	Mussels, shelled cooked	1	France	3	P	2	0	2																								
Degnan <i>et al</i> , 1994	Crab	1	USA	2	R	4	1	2							1																	
Farber, 1991b	Shrimp, wholesale	1	Canada	1	R	49	45	1			1		2																			
Hartemink and Georgsson, 1991	Shellfish, cooked	1	Iceland	1	P or R	11	11	0																								
Hartemink and Georgsson, 1991	Shrimp, cooked & processed	1	Iceland	1	P or R	11	10	1																								
Oregon State Dept of Agriculture, 2001	Crab, cooked	1	USA	3	R	95	90	5																								
Oregon State Dept of Agriculture, 2001	Shrimp, cooked	1	USA	3	R	236	234	2																								
Oregon State Dept of Agriculture, 2001	Crab, imitation	1	USA	3	R	24	24	0																								
Ravomanana <i>et al</i> , 1993	Shrimp, cooked	1	France	1	R?	35	31	4																								
Rawles <i>et al</i> , 1995	Crab	1	USA	2	P	126	116	E ⁴					1		8												1					
Richmond, 1990	Miscellany, cooked	1	UK	1	R	40	40	0																								
Valdimarsson, <i>et al</i> , 1998	Shrimp, cooked & frozen	1	Iceland	2	P	3331	3259	72																								
Weagant <i>et al</i> , 1988	Crab, cooked	1	USA	1	R or P	24	17	7																								
Weagant <i>et al</i> , 1988	Shrimp, cooked	1	USA	1	R or P	8	6	2																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Yamazaki <i>et al</i> , 2000	Seafood, boiled	1	Japan	3	R	8	8	0																								
Total=						4004	3892	98			1		3		9													1				

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Vegetables Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Beckers <i>et al.</i> , 1987	Vegetables, fresh & cut	1	Nether-lands	1	?	25	14	E ⁴										11														
Benezet <i>et al.</i> , 2001	Celery,	1	Spain	3	P	3	3	0																								
Benezet <i>et al.</i> , 2001	Cilantro	1	Spain	3	P	1	1	0																								
Benezet <i>et al.</i> , 2001	Onion,	1	Spain	3	P	3	3	0																								
Benezet <i>et al.</i> , 2001	Laurel	1	Spain	3	P	1	1	0																								
Benezet <i>et al.</i> , 2001	Parsley	1	Spain	3	P	1	1	0																								
Benezet <i>et al.</i> , 2001	Thyme	1	Spain	3	P	1	1	0																								
Benezet <i>et al.</i> , 2001	Winter sweet	1	Spain	3	P	2	2	0																								
Breer, 1988	Salads	1	Switzer-land	1	R	64	61	3																								
Breer, 1988	Vegetables	1	Switzer-land	1	R	27	27	0																								
Choi <i>et al.</i> ,2001	Vegetables, raw	2	Korea	3	R	205	205	0																								
Daley <i>et al.</i> , 1999	Vegetables	1	Canada	3	R	25	25	0																								
de Simon <i>et al.</i> , 1992	Vegetables, fresh	1	Spain	1	R	103	95	8																								
Farber <i>et al.</i> , 1989	Celery	1	Canada	1	R	30	30	0																								
Farber <i>et al.</i> , 1989	Lettuce	1	Canada	1	R	50	50	0																								
Farber <i>et al.</i> , 1989	Radishes	1	Canada	1	R	10	10	0																								
Farber <i>et al.</i> , 1989	Tomatoes	1	Canada	1	R	20	20	0																								
Garcia-Gimeno <i>et al.</i> , 1996	Salads	1	Spain	2	P	70	49	21																								
Hartung, 2000b	Salads, minimally processed fresh vegetables	1	Germany	3	R	59	58	1																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Hartung, 2001	Vegetable foods, other	1	Germany	3	R?	676	671	5																								
Hartung, 2001	Vegetable foods, other	1	Germany	3	R?	672	667	E									5															
Hartung, 1999	Salad	1	Germany	3	R	23	20	3																								
Heinitz, 1999	Salads, vegetable	1	USA	3	P	361	341	20																								
Heisick <i>et al.</i> , 1989	Cabbage	1	USA	1	R	92	91	1																								
Heisick <i>et al.</i> , 1989	Cucumbers	1	USA	1	R	92	90	2																								
Heisick <i>et al.</i> , 1989	Lettuce	1	USA	1	R	92	92	0																								
Heisick <i>et al.</i> , 1989	Mushrooms	1	USA	1	R	92	92	0																								
Heisick <i>et al.</i> , 1989	Radishes	1	USA	1	R	132	113	19																								
Inoue <i>et al.</i> , 2000	Vegetables	1	Japan	3	R	285	285	0																								
Karpiskova <i>et al.</i> , 2000	Vegetables	1	Czech Republic	3	R	156	152	4																								
Lin <i>et al.</i> , 1996	Salads, vegetable	1	USA	2	R	58	57	1																								
Marranzano <i>et al.</i> , 1996	Celery	1	Italy	2	R	20	18	2																								
Marranzano <i>et al.</i> , 1996	Fennel	1	Italy	2	R	31	30	1																								
Marranzano <i>et al.</i> , 1996	Lettuce	1	Italy	2	R	32	31	1																								
McLauchlin and Gilbert, 1990	Vegetables & salads,	1	UK	1	?	567	495	69																		3						
McLauchlin and Gilbert, 1990	Vegetables & salads,	1	UK	1	?	279	255	24																								
Monge and Arias, 1996	Cabbage salad	1	Costa Rica	2	R	50	40	10																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
NFPA, 2002	Salad, leafy bagged & precut	1	USA-CA	3	R	1515	1501	E	12	1					1																	
NFPA, 2002	Salad, leafy bagged & precut	1	USA-MD	3	R	1448	1440	E	5				1		1					1												
Odumeru <i>et al.</i> , 1997	Broccoli florets	1	Canada	2	P	15	13	E											2													
Odumeru <i>et al.</i> , 1997	Broccoli florets	1	Canada	2	P	20	20	E																								
Odumeru <i>et al.</i> , 1997	Coleslaw mix	1	Canada	2	P	15	14	E											1													
Odumeru <i>et al.</i> , 1997	Coleslaw mix	1	Canada	2	P	20	20	E																								
Odumeru <i>et al.</i> , 1997	Green peppers	1	Canada	2	P	20	20	E																								
Odumeru <i>et al.</i> , 1997	Green peppers	1	Canada	2	P	15	14	E										1														
Odumeru <i>et al.</i> , 1997	Lettuce, chopped	1	Canada	2	P	24	22	E										2														
Odumeru <i>et al.</i> , 1997	Lettuce, chopped	1	Canada	2	P	15	12	E										2	1													
Odumeru <i>et al.</i> , 1997	Salad mix	1	Canada	2	P	15	9	E										2	4													
Odumeru <i>et al.</i> , 1997	Salad mix	1	Canada	2	P	24	21	E										2	1													
Oregon State Dept of Agriculture, 2001	Broccoli	1	USA	3	R	3	3	0																								
Oregon State Dept of Agriculture, 2001	Cabbage	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Celery	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Cilantro	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Green Beans	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Jalapeno	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Kelp	1	USA	3	R	11	10	1																								
Oregon State Dept of Agriculture, 2001	Kidney, Mung. Bean	1	USA	3	R	33	33	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Oregon State Dept of Agriculture, 2001	Lettuce	1	USA	3	R	15	15	0																								
Oregon State Dept of Agriculture, 2001	Salad, mixed vegetable	1	USA	3	R	49	47	2																								
Oregon State Dept of Agriculture, 2001	Mushroom	1	USA	3	R	6	6	0																								
Oregon State Dept of Agriculture, 2001	Onion	1	USA	3	R	6	6	0																								
Oregon State Dept of Agriculture, 2001	Pea	1	USA	3	R	6	6	0																								
Oregon State Dept of Agriculture, 2001	Potato	1	USA	3	R	14	14	0																								
Oregon State Dept of Agriculture, 2001	Radish	1	USA	3	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Spinach	1	USA	3	R	3	2	1																								
Oregon State Dept of Agriculture, 2001	Sprouts	1	USA	3	R	109	109	0																								
Oregon State Dept of Agriculture, 2001	Tomato	1	USA	3	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Vegetable	1	USA	3	R	12	12	0																								
Oregon State Dept of Agriculture, 2001	Yam	1	USA	3	R	2	2	0																								
Pingulkar <i>et al.</i> , 2001	Root, beet	2	India	3	R	4	4	0																								
Pingulkar <i>et al.</i> , 2001	Cabbage	2	India	3	R	4	3	1																								
Pingulkar <i>et al.</i> , 2001	Carrot	2	India	3	R	4	4	0																								
Pingulkar <i>et al.</i> , 2001	Coriander	1	India	3	R	10	9	1																								
Pingulkar <i>et al.</i> , 2001	Cucumber	2	India	3	R	4	4	0																								
Pingulkar <i>et al.</i> , 2001	Lettuce	2	India	3	R	4	4	0																								
Pingulkar <i>et al.</i> , 2001	Leaves, math vegetable	2	India	3	R	4	4	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Pingulkar <i>et al.</i> , 2001	Roots, math	2	India	3	R	4	4	0																								
Pingulkar <i>et al.</i> , 2001	Leaves, radish	2	India	3	R	4	4	0																								
Pingulkar <i>et al.</i> , 2001	Roots, radish	2	India	3	R	4	4	0																								
Pingulkar <i>et al.</i> , 2001	Salads, ready-to-eat	2	India	3	R	12	12	0																								
Pingulkar <i>et al.</i> , 2001	Capsicum	2	India	3	R	4	3	1																								
Porto <i>et al.</i> , 2001	Cabbage	2	Brazil	3	R	50	50	0																								
Porto <i>et al.</i> , 2001	Lettuce	2	Brazil	3	R	100	96	2				2																				
Porto <i>et al.</i> , 2001	Parsley	1	Brazil	3	R	50	48	2																								
Porto <i>et al.</i> , 2001	Watercress	1	Brazil	3	R	50	48	2																								
Salamah, 1993	Cabbage	2	Saudi Arabia	1	R	70	68	2																								
Salamah, 1993	Carrot	2	Saudi Arabia	1	R	120	104	16																								
Salamah, 1993	Cucumber	2	Saudi Arabia	1	R	110	106	4																								
Salamah, 1993	Lettuce	2	Saudi Arabia	1	R	80	79	1																								
Sizmur and Walker, 1988	Vegetables, mixed	1	UK	1	R	60	56	4																								
Soriano <i>et al.</i> , 2001	Lettuce	1	Spain	3	R	10	9	1																								
Soriano <i>et al.</i> , 2001	Lettuce,	1	Spain	3	R	10	9	1																								
Soriano <i>et al.</i> , 2001	Spinach	1	Spain	3	R	10	10	0																								
Soriano <i>et al.</i> , 2001	Spinach	1	Spain	3	R	10	10	0																								
Szabo <i>et al.</i> , 2000	Lettuce	1	Australia	3	R	60	59	1																								
Szabo <i>et al.</i> , 2000	Lettuce	1	Australia	3	P	60	58	2																								
Teufel and Bendzulla, 1993	Legumes	1	Germany	1	R?	13	12	1																								
Teufel and Bendzulla, 1993	Mushrooms	1	Germany	1	R?	8	8	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Teufel and Bendzulla, 1993	Vegetables, fresh	1	Germany	1	R?	6	6	0																								
Velani and Roberts, 1991	Individual salad ingredients (bean sprouts, cabbage, carrot, celery, cress, cucumber, lettuce, mushroom, peppers, radish, spring onions, tomato, vegetables, watercress)	1	UK	1	R	108	106	E													2											
Velani and Roberts, 1991	Salads, mixed & prepacked	1	UK	1	R	42	34	E													8											
West and North Yorkshire Joint Working Group, 1991	Salad, raw vegetables	1	UK	1	R	237	224	2								5	3				2					1						
Wong <i>et al.</i> , 1990	Vegetables	2	Taiwan	1	R	49	43	6																								
Total=						9223	8892	249	17	1		2	1		2	5	3	25	9	3		10				1	3					

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Fruit Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Heinitz, 1999	Fruit products	1	USA	3	P	117	89	28																								
Karpiskova <i>et al.</i> , 2000	Fruit, dried	1	Czech Republic	3	R	12	12	0																								
Oregon State Dept of Agriculture, 2001	Apples	1	USA	3	R	12	12	0																								
Oregon State Dept of Agriculture, 2001	Blueberries	1	USA	3	R	6	4	2																								
Oregon State Dept of Agriculture, 2001	Cantalope	1	USA	3	R	8	8	0																								
Oregon State Dept of Agriculture, 2001	Salad, fruit	1	USA	3	R	23	23	0																								
Oregon State Dept of Agriculture, 2001	Fruit, various	1	USA	3	R	17	17	0																								
Oregon State Dept of Agriculture, 2001	Gelatin dessert with fruit	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Melons	1	USA	3	R	8	8	0																								
Oregon State Dept of Agriculture, 2001	Pears	1	USA	3	R	35	35	0																								
Oregon State Dept of Agriculture, 2001	Pineapples	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Watermelons	1	USA	3	R	4	4	0																								
Teufel and Bendzulla, 1993	Fruit, fresh	1	Germany	1	R?	7	7	0																								
Teufel and Bendzulla, 1993	Fruit, product	1	Germany	1	R?	1	1	0																								
Total=						254	224	30																								

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

Fresh Soft Cheese Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Frye, 2000	Queso Fresco	1	USA	3	R	1724	1678	46																								
Frye, 2000	Queso Fresco	1	USA	3	R	22	20	2																								
Gelosa, 1990	Cheese, fresh (fornaggio fresco)	1	Italy	1	R	17	17	0																								
NFPA, 2002	Cheese, Hispanic style	1	USA-CA	3	R	1482	1481	E ⁴							1																	
NFPA, 2002	Cheese, Hispanic style	1	USA-MD	3	R	1454	1450	E	2						2																	
Oregon State Dept of Agriculture, 2001	Queso Fresco	1	USA	3	R	13	11	2																								
Oregon State Dept of Agriculture, 2001	Panela	1	USA	3	R	1	1	0																								
Saltijeral <i>et al.</i> , 1999	Panellá	1	Mexico	3	R	40	34	6																								
Ubach <i>et al.</i> , 1991	Quesofresco, requesoy	1	Spain	1	R?	91	84	7																								
Weber <i>et al.</i> , 1988	Cheese, fresh cow & goat milk	1	Germany	1	?	22	20	2																								
Total=						4866	4796	65	2					3																		

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² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Soft Unripened Cheese Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Copes <i>et al.</i> , 2000	Cheeses, soft paste	2	Argentina	3	R	35	31	4																								
Frye, 2000	Cheese, farmer	1	USA	3	R	18	18	0																								
Frye, 2000	Gournay	1	USA	3	R	1	1	0																								
Frye, 2000	Cheese, fresh port	1	USA	3	R	84	83	1																								
Frye, 2000	Quark	1	USA	3	R	1	1	0																								
Frye, 2000	Cheese, sheep milk	1	USA	3	R	1	1	0																								
Greenwood <i>et al.</i> , 1991	Cheese, unripened	1	UK	1	R	366	362	E ⁴																	4							
McLauchlin and Gilbert, 1990	Cheese, cottage	1	UK	1	?	137	137	0																								
McLauchlin <i>et al.</i> , 1990	Anari	1	UK	1	R/P	23	9	E					10																			4
McLauchlin <i>et al.</i> , 1990	Halloumi	1	UK	1	R/P	11	3	E					8																			
Oregon State Dept of Agriculture, 2001	Cheese, cottage	1	USA	3	R	12	12	0																								
Oregon State Dept of Agriculture, 2001	Cheese, cream	1	USA	3	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Creme Mexicana	1	USA	3	R	4	4	0																								
Teufel and Bendzulla, 1993	Spieisequark	1	Germany	1	R	22	21	E										1														
Teufel and Bendzulla, 1993	Spieisequark-quargel	1	Germany	1	R	20	20	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
West and North Yorkshire Joint Working Group, 1991	Cheese, cottage	1	UK	1	R	74	74	0																								
Total=						814	782	5				18						1							4							4

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³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Soft Ripened Cheese Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Beckers <i>et al.</i> , 1987	Brie/ Camembert (from pasteurized milk)	1	Netherlands	1	?	51	51	0																								
Beckers <i>et al.</i> , 1987	Brie/ Camembert (from raw milk)	1	Netherlands	1	?	18	8	0																		10						
Botarelli <i>et al.</i> , 1999	Feta/cheese, soft & short-ripened	1	Italy	3	R	15	15	0																								
Botarelli <i>et al.</i> , 1999	Brie/cheese, soft & short-ripened	1	Italy	3	R	15	15	0																								
Botarelli <i>et al.</i> , 1999	Crescenza/ cheese, soft & short-ripened	1	Italy	3	R	15	15	0																								
Botarelli <i>et al.</i> , 1999	Taleggio/ cheese, soft, short-ripened	1	Italy	3	R	15	15	0																								
Breer and Schopfer, 1989	Cheese, white mold	1	Switzerland	1	?	261	254	7																								
Delgado da Silva <i>et al.</i> , 1998	Minas frescal chomemadel, Brazilian soft cheese eaten fresh	2	Brazil	2	R	17	10	7																								
Frye, 2000	Cheese, feta	1	USA	3	R	34	34	0																								
Frye, 2000	Brie	1	USA	3	R	20	20	0																								
Frye, 2000	Camambert	1	USA	3	R	12	12	0																								
Frye, 2000	Mozzarella	1	USA	3	R	17	17	0																								
Hartung, 2000a.	soft, mold-ripened cheese	1	Germany	3	R	234	230	4																								
Hartung, 2001	soft, mold-ripened cheese	1	Germany	3	?	62	59	3																								
Hartung, 2001	soft, mold-ripened cheese	1	Germany	3	?	41	39	E ⁴										1										1				

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Hartung, 1999	soft, mold-ripened cheese	1	Germany	3	R	82	74	8																								
Loncarevic <i>et al.</i> , 1995	soft, mold-ripened cheese	1	Europe Sweden	2	R	31	18	E									9			1							2				1	
McLauchlin <i>et al.</i> , 1990	Feta	1	UK	1	R	3	3	0																								
NFPA, 2002	Cheese, soft mold ripened	1	USA	3	R	1347	1333	E	12				2																			
Oregon State Dept of Agriculture, 2001	Cheese, Camembert	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Cheese, pyramid goat	1	USA	3	R	10	10	0																								
Oregon State Dept of Agriculture, 2001	Cheese, feta goat	1	USA	3	R	9	9	0																								
Oregon State Dept of Agriculture, 2001	Mozzarella	1	USA	3	R	2	2	0																								
Pinto and Reali, 1996	Taleggio	1	Italy	2	R	45	45	0																								
Pinto and Reali, 1996	Mozzarella	1	UK	2	R	29	25	4																								
Rudolf <i>et al.</i> , 2001	Cheese, soft	1	Europe	3	P or R	192	180	12																								
Sanchez-Rey <i>et al.</i> , 1993	La Serena cheese, from raw ewes milk	1	Spain	1	P	15	10	5																								
Teufel and Bendzulla, 1993	Hartz mountain cheese Harzerkase	1	Germany	1	R	19	19	E																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Teufel and Bendzulla, 1993	Hartz mountain cheese Harzerkase	1	Germany	1	R?	19	14	5																								
Teufel and Bendzulla, 1993	Cheese, Sauermulchkase-sour milk hand	1	Germany	1	R	53	48	5																								
Teufel and Bendzulla, 1993	Cheese, Sauermulchkase-sour milk hand	1	Germany	1	R	69	64	E										2			3											
Teufel and Bendzulla, 1993	Romadur	1	Germany	1	R	23	18	E										5														
Weber <i>et al.</i> , 1988	Cheese, soft	1	Germany	1	?	22	22	0																								
Weber <i>et al.</i> , 1988	Cheese, soft cow	1	Germany	1	?	307	299	8																								
Weber <i>et al.</i> , 1988	Cheese, soft goat & sheep	1	Germany	1	?	4	4	0																								
Total=						3109	2992	68	12				2					17		1	3					10	2	1			1	

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³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Semi-Soft Cheese Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Botarelli <i>et al.</i> , 1999	Gorgonzola/ cheese	1	Italy	3	R	40	38	E ⁴															2									
Breer and Schopfer, 1989	Cheese, semi-soft	1	Switzer-land	1	?	205	201	4																								
de Boer and Kuik, 1987	Cheese, blue-veined	1	Nether-lands	1	R	20	18	2																								
Frye, 2000	Cheese, blue	1	USA	3	R	22	22	0																								
Frye, 2000	Butter cheese	1	USA	3	R	1	1	0																								
Frye, 2000	Gorgonzola	1	USA	3	R	2	2	0																								
Frye, 2000	Cheese, Gouda	1	USA	3	R	39	39	0																								
Frye, 2000	Cheese, Gouda	1	USA	3	R	1	1	0																								
Frye, 2000	Havarti	1	USA	3	R	4	4	0																								
Frye, 2000	Cheese, Jack	1	USA	3	R	2	2	0																								
Frye, 2000	Limburger	1	USA	3	R	7	7	0																								
Frye, 2000	Pinna Ricotta	1	USA	3	R	5	2	3																								
Frye, 2000	Roquefort	1	USA	3	R	2	2	0																								
Frye, 2000	Cheese, semi-soft	1	USA	3	R	135	135	0																								
Frye, 2000	Cheese, semi-soft	1	USA	3	R	6	6	0																								
Frye, 2000	Cheese, string	1	USA	3	R	4	4	0																								
NFPA, 2001	Cheese, blue-veined soft	1	USA	3	R	1623	1600	E	18	3			1		1																	
Oregon State Dept of Agriculture, 2001	Cheese, blue	1	USA	3	R	21	21	0																								
Oregon State Dept of Agriculture, 2001	Cheese, Monterey Jack	1	USA	3	R	54	54	0																								
Oregon State Dept of Agriculture, 2001	Muenster	1	USA	3	R	1	1	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Oregon State Dept of Agriculture, 2001	Cheese, semi-soft goat	1	USA	3	R	6	6	0																								
Oregon State Dept of Agriculture, 2001	Cheese, string	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Cheese, Swiss	1	USA	3	R	12	12	0																								
Pinto and Reali, 1996	Gorgonzola	1	UK	2	R	58	55	3																								
Rudolf and Scherer, 2001	Cheese, semi-soft	1	Europe	3	P or R	92	85	7																								
Saltijeral <i>et al.</i> , 1999	Manchego	1	Mexico	3	R	40	40	0																								
Teufel and Bendzulla, 1993	Edam	1	Germany	1	R	3	1	E										2														
Teufel and Bendzulla, 1993	Edam	1	Germany	1	R	9	9	0																								
Teufel and Bendzulla, 1993	Limburger	1	Germany	1	R	21	19	E										1			1											
Teufel and Bendzulla, 1993	Limburger	1	Germany	1	R	1	1	0																								
Teufel and Bendzulla, 1993	Muenster	1	Germany	1	R	5	0	5																								
Teufel and Bendzulla, 1993	Muenster	1	Germany	1	R	8	0	E										1			6							1				
Teufel and Bendzulla, 1993	Stangenkase, Limburger type	1	Germany	1	R	3	3	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Teufel and Bendzulla, 1993	Stangenkase, Limburger type	1	Germany	1	R	11	10	E													1											
Weber <i>et al.</i> , 1988	Cheese, semi-soft	1	Germany	1	?	144	125	19																								
Weber <i>et al.</i> , 1988	Cheese, sheep semi-soft	1	Germany	1	?	6	6	0																								
Total=						2615	2534	43	18	3			1		1			4			8		2					1				

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² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Hard Cheese Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Breer and Schopfer, 1989	Cheese, hard Hartkase	1	Switzerland	1	?	88	88	0																								
Delgado da Silva <i>et al.</i> , 1998	Cheese, Cheddar	2	Brazil	2	R	2	2	0																								
Frye, 2000	Cacique Asadero	1	USA	3	R	1	1	0																								
Frye, 2000	Cheese, Colby Jack semi-soft	1	USA	3	R	1	1	0																								
Frye, 2000	Cheese, Parmesan	1	USA	3	R	2	2	0																								
Frye, 2000	Cheese, Provolone	1	USA	3	R	1	1	0																								
Frye, 2000	Queso Anejo	1	USA	3	R	1	1	0																								
Greenwood <i>et al.</i> , 1991	Cheese, hard	1	UK	1	R	66	65	E ⁴																1								
Lanciotti <i>et al.</i> , 1999	Cheese, hard ripened	1	Italy	3	P	45	45	0																								
McLauchlin and Gilbert, 1990	Cheese, hard	1	UK	1	?	448	442	6																								
McLauchlin <i>et al.</i> , 1990	Cheese, Cheddar goat	1	UK	1	R/P	8	4	E					2																		1	1
McLauchlin <i>et al.</i> , 1990	Gjestost	1	UK	1	R	1	0	E					1																			
Oregon State Dept of Agriculture, 2001	Cheese, Cheddar	1	USA	3	R	65	65	0																								
Oregon State Dept of Agriculture, 2001	Cheese, Cheddar	1	USA	3	R	19	19	0																								
Oregon State Dept of Agriculture, 2001	Cheese, Colby Jack	1	USA	3	R	9	9	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Oregon State Dept of Agriculture, 2001	Cheese, hard	1	USA	3	R	48	48	0																								
Oregon State Dept of Agriculture, 2001	Quesco Cotija	1	USA	3	R	5	5	0																								
Rudolf and Scherer, 2001	Cheese, hard	1	Europe	3	P or R	45	43	2																								
Saltijeral <i>et al.</i> , 1999	Chihuahua	1	Mexico	3	R	40	40	0																								
Weber <i>et al.</i> , 1988	Cheese, hard	1	Germany	1	?	4	4	0																								
West and North Yorkshire Joint Working Group, 1991	Cheese, hard	1	UK	1	R	74	74	0																								
Total=						973	959	8					3												1						1	1

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Processed Cheese Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Baek <i>et al.</i> , 2000	Cheese, pasturized & processed	2	Korea	3	R	45	45	0																								
Ng and Seah, 1995	Cheese & spreads	2	Singapore	2	P/R	103	103	0																								
Oregon State Dept of Agriculture, 2001	Cheese, processed	1	USA	3	R	4	4	0																								
Teufel and Bendzulla, 1993	Cheese, Schnittkase-sliced	1	Germany	1	R	96	95	1																								
Teufel and Bendzulla, 1993	Cheese, Schnittkase-sliced	1	Germany	1	R	77	75	E ⁴										2														
Total=						325	322	1									2															

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Pasteurized Milk Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Ahrabi <i>et al.</i> , 1997	Milk, cow's	2	Turkey	2	R	20	19	1																								
Arnold and Coble, 1995	Milk, cow's	1	Australia	2	R	33	33	0																								
Baek <i>et al.</i> , 2000	Milk, pasteurized	2	Korea	3	R	26	26	0																								
Beckers <i>et al.</i> , 1987	Milk, cow's	1	Nether-lands	1	?	41	41	0																								
Casarotti <i>et al.</i> , 1994	Milk, cow's	2	Brazil	2	R	20	20	0																								
Farber <i>et al.</i> , 1989	Milk, cow's	1	Canada	1	R	14	14	0																								
Fernandez Garayzabal <i>et al.</i> , 1986	Milk, cow's	1	Spain	1	P	28	22	6																								
Gelosa, 1990	Milk, cow's	1	Italy	1	R	7	7	0																								
Gohil <i>et al.</i> , 1995	Milk, cow's	2	UA Emirates	2	R	182	182	0																								
Greenaway and Drew, 1990	Milk, cow's	1	Australia	1	P	77	77	0																								
Greenwood <i>et al.</i> , 1991	Milk, cow's	1	UK	1	R	1039	1028	11																								
Hartung, M. 2000b	Milk, pasteurized	1	Germany	3	R	651	651	0																								
Hartung, 2001	Milk, pasteurized	1	Germany	3	R	1452	1451	E ⁴									1															
Hartung, M., 1999	Milk, UHT	1	Germany	3	R	28	28	0																								
Hartung, M., 1999	Pasteurized milk	1	Germany	3	R	690	690	0																								
Harvey and Gilmour, 1992	Milk, cow's	1	Northern Ireland	1		95	94	1																								
Ibrahim <i>et al.</i> , 1992	Milk, cow's	1	Hungary	1	R	100	100	0																								
Ibrahim <i>et al.</i> , 1992	Milk, cow's	1	Hungary	1	R	60	53	7																								
Frye/IDFA, 2000b	Milk, cow's whole	1	USA	3	R	1897	1897	0																								
Frye/IDFA,2000b	Milk, cow's skim	1	USA	3	R	1846	1845	1																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Frye/IDFA, 2000b	Milk, cow's Chocolate	1	USA	3	R	1669	1669	0																								
Frey/IDFA, 2000b	Milk, cow's reduced fat	1	USA	3	R	107	107	0																								
Frye/IDFA, 2000b	Milk, cow's	1	USA	3	R	285	285	0																								
Kozak <i>et al.</i> , 1996	Milk, chocolate	1	USA	1	P	415	410	5																								
Kozak <i>et al.</i> , 1996	Milk, lowfat	1	USA	1	P	282	282	0																								
Kozak <i>et al.</i> , 1996	Milk, skim	1	USA	1	P	98	98	0																								
Kozak <i>et al.</i> , 1996	Milk, whole	1	USA	1	P	350	348	2																								
Laciar <i>et al.</i> , 1999	Milk, cow's	2	Argentina	3	P	80	80	0																								
McLaughlin and Gilbert, 1990	Milk, cow's	1	UK	1	?	469	469	0																								
Mickova, 1991	Milk, cow's	1	Czecho-slovakia	1	P	30	30	0																								
Moura <i>et al.</i> , 1993	Milk, cow's	2	Brazil	1	P	220	220	0																								
Oregon State Dept of Agriculture, 2001	Milk, chocolate	1	USA	3	R	7	7	0																								
Oregon State Dept of Agriculture, 2001	Milk, cow's	1	USA	3	R	39	39	0																								
Oregon State Dept of Agriculture, 2001	Milk, goat's	1	USA	3	R	1	1	0																								
Rola, 1994	Milk, cow's	1	Poland	1	?	73	73	0																								
Roy, 1992	Milk, cow's	1	Scotland	1	?	115	111	4																								
Sharif and Tunail, 1991	Milk, cow's	2	Turkey	1	R	22	22	0																								
Teufel and Bendzulla, 1993	Milk, cow's	1	Germany	1	R?	443	442	1																								
Teufel and Bendzulla, 1993	Milk, treated	1	Germany	1	R?	41	39	E									2															
Tiscione <i>et al.</i> , 1994	Milk, cow's	1	Italy	2	P	50	50	0																								
Venables, 1989	Milk, cow's	1	Australia	1	P	206	205	1																								
West and North Yorkshire Joint Working Group, 1991	Milk, cow's	1	UK	1	R	66	65	E							1																	
Total=						12407	12363	40							1		3															

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1. ² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown. ⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Non-pasteurized Milk Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Abou-Eleinin <i>et al.</i> , 2000	Milk, raw goat	1	USA	3	P	450	433	17																								
Anonymous, 1989	Cows' milk	1	France	1	?	1409	1324	85																								
Arias <i>et al.</i> , 1994	Cows' milk	2	Costa Rica	2	P	220	220	0																								
Baek <i>et al.</i> , 2000	Milk, raw	2	Korea	3	R	45	43	2																								
Beckers <i>et al.</i> , 1987	Cows' milk	1	Nether-lands	1	?	137	131	E ⁴									6															
Casarotti <i>et al.</i> , 1994	Cows' milk	2	Brazil	2	R	20	20	0																								
Davidson <i>et al.</i> , 1989	Cows' milk	1	Canada	1	P	256	252	4																								
Desmaures <i>et al.</i> , 1997	Cows' milk	1	France	2	P	69	65	4																								
Dominguez Rodrigues <i>et al.</i> , 1985	Cows' milk	1	Spain	1	P	95	52	43																								
Donnelly <i>et al.</i> , 1988	Cows' milk	1	USA	1	P	939	924	15																								
Doyle and Schoeni, 1986	Cows' milk	1	USA	1	P	50	50	0																								
El Marrakchi <i>et al.</i> , 1993	Cows' milk	2	Morocco	1	R	30	27	3																								
El-Leboudy and Fayad, 1992	Cows' milk	2	Egypt	1	P	236	229	7																								
Farber <i>et al.</i> , 1988	Cows' milk	1	Canada	1	P	445	439	6																								
Fedio and Jackson, 1990	Cows' milk	1	Canada	1	P	36	35	1																								
Fedio and Jackson, 1990	Cows' milk	1	Canada	1	P	36	32	4																								
Fedio and Jackson, 1990	Cows' milk	1	Canada	1	P	426	418	8																								
Fenlon and Wilson, 1989	Cows' milk	1	Scotland	1	P	540	526	14																								
Fenlon <i>et al.</i> , 1995	Cows' milk	1	Scotland	2	P	727	638	44				32	13																			

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Fernandez Garayzabul <i>et al.</i> , 1987	Cows' milk	1	Spain	1	P	67	37	30																								
Frye/IDFA, 2000	Milk, raw goat	1	USA	3	R	65	64	1																								
Frye/IDFA, 2000	Milk, raw	1	USA	3	R	194	193	1																								
Gledel, 1986	Milk, cow's	1	France	1	?	51	41	10																								
Gledel, 1986	Milk, cow's	1	France	1	?	337	323	14																								
Greenwood <i>et al.</i> , 1991	Milk, cow's	1	UK	1	P	361	348	13																								
Hartung, 2000a.	Raw milk for sale (raw milk off farm)	1	Germany	3	R	187	184	3																								
Hartung, 2000a.	Milk, untreated (bulk raw milk)	1	Germany	3	R	964	955	9																								
Hartung, 2000a.	Milk, certified raw	1	Germany	3	R	415	415	0																								
Hartung, 1999	Raw milk for sale (raw milk off farm)	1	Germany	3	R	166	165	1																								
Hartung, 1999	Milk, untreated (bulk raw milk)	1	Germany	3	R	1273	1263	10																								
Hartung, 1999	Milk, certified & raw	1	Germany	3	R	439	439	0																								
Harvey and Gilmour, 1992	Milk, cow's	1	N. Ireland	1	P	176	149	27																								
Laciar <i>et al.</i> , 1999	Milk, cow's	2	Argentina	3	P?	208	207	1																								
Liewen and Plautz, 1988	Milk, cow's	1	USA	1	P	200	192	8																								
Lovett <i>et al.</i> , 1987	Milk, cow's	1	USA	1	P	650	623	27																								
Luisjuan-Morales <i>et al.</i> , 1995	Milk, cow's	1	Mexico	2	R	100	100	0																								
Lund <i>et al.</i> , 1991	Milk, cow's	1	USA	1	P	300	291	9																								
McLauchlin and Gilbert, 1990	Milk, cow's	1	UK	1	?	331	323	8																								
McLauchlin and Gilbert, 1990	Non-bovine	1	UK	1	?	412	412	0																								
McLauchlin <i>et al.</i> , 1990	Milk, goat's	1	UK	1	P	7	7	0																								
Moura <i>et al.</i> , 1993	Milk, cow's	2	Brazil	1	P	220	199	21																								
Oni <i>et al.</i> , 1989	Milk, cow's	2	Nigeria	1	P	150	149	1																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Oregon State Dept of Agriculture, 2001	Milk, cow's	1	USA	3	R	385	384	1																								
Oregon State Dept of Agriculture, 2001	Milk, goat's	1	USA	3	R	171	171	0																								
Patterson <i>et al.</i> , 1989	Milk, cow's	1	USA	1	P	12	12	0																								
Razavi-Rohani and Hedaiaitinia, 1990	Milk, cow's	2	Iran	1	P/R	190	186	4																								
Rea <i>et al.</i> , 1992	Milk, cow's	1	Ireland	1	P	589	560	29																								
Rodler and Köerbler, 1989	Milk, cow's	1	Hungary	1	P	80	77	3																								
Rohrbach <i>et al.</i> , 1992	Milk, cow's	1	USA	1	P	292	280	12																								
Slade and Collins-Thompson, 1988	Milk, cow's	1	Canada	1	P	315	298	17																								
Steele <i>et al.</i> , 1997	Milk, cow's (farm bulk tank)	1	Canada	2	P	1720	1673	47																								
Stone, 1987	Milk, cow's	1	New Zealand	1	P	71	71	0																								
Takai <i>et al.</i> , 1990	Milk, cow's	1	Japan	1	P	120	120	0																								
Teufel and Bendzulla, 1993	Milk, cow's	1	Germany	1	R?	97	93	E									4															
Teufel and Bendzulla, 1993	Milk, cow's	1	Germany	1	R?	256	256	0																								
Teufel and Bendzulla, 1993	Non-bovine	1	Germany	1	R?	39	39	0																								
Teufel and Bendzulla, 1993	Non-bovine	1	Germany	1	R?	4	4	0																								
Vázquez-Salinas <i>et al.</i> 2001	Milk, raw	1	Mexico	3	P	1300	1138	162																								
Total=						19080	18299	726				32		13			10															

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1. ² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present. ³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown. ⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Frozen Dairy Products Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Arnold and Coble, 1995	Ice cream	1	Australia	2	R	166	143	23																								
Baek <i>et al.</i> , 2000	Ice cream	2	Korea	3	R	132	124	8																								
Choi et al.,2001	Ice cream	2	Korea	3	R	25	25	0																								
Ciftcioglu <i>et al.</i> , 1992	Ice cream	2	Turkey	1	?	50	45	5																								
Farber <i>et al.</i> , 1989	Ice cream, novelty	1	Canada	1	P	51	50	1																								
Farber <i>et al.</i> , 1989	Ice cream	1	Canada	1	P	394	393	1																								
Farber <i>et al.</i> , 1989	Ice cream mix	1	Canada	1	P	85	85	0																								
Frye, 2000	Frozen dairy products	1	USA	3	R	69	65	4																								
Greenwood <i>et al.</i> , 1991	Ice cream	1	UK	1	R	150	147	3																								
Hartung, 2000a.	Ice cream =speiseeis	1	Germany	3	R	2490	2489	1																								
Hartung, 2001	Speiseeis = icecream	1	Germany	3	R	1694	1692	2																								
Hartung, 2001	Speiseeis = icecream	1	Germany	3	R	1696	1694	E ⁴									2															
Hartung, 1999	Ice cream =speiseeis	1	Germany	3	R	2628	2625	3																								
Heinitz, 1999	Ice cream	1	USA	3	P	294	270	24																								
IDFA, 1999	Ice cream, novelties	1	USA	3	R	1227	1196	31																								
IDFA, 1999	Ice cream, novelties (0.01 detection limit)	1	USA	3	R	19320	19311	9																								
IDFA, 1999	Ice cream/ frozen yogurt	1	USA	3	R	517	517	0																								
Kozak <i>et al.</i> , 1996	Ice cream, novelty	1	USA	2	P	351	321	30																								
Kozak <i>et al.</i> , 1996	Ice cream	1	USA	2	P	716	688	28																								
Kozak <i>et al.</i> , 1996	Ice milk	1	USA	2	P	42	42	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Maifreni <i>et al.</i> , 1993	Ice cream	1	Germany	1	R	396	396	0																								
McLauchlin and Gilbert, 1990	Ice cream	1	UK	1	?	274	257	17																								
Monge <i>et al.</i> , 1994	Ice cream	1	Costa Rica	2	R	50	49	1																								
Monge <i>et al.</i> , 1994	Ice cream	1	Costa Rica	2	R	50	49	1																								
Ng and Seah, 1995	Ice cream	2	Singapore	2	P/R	61	61	0																								
Oregon State Dept of Agriculture, 2001	Frozen yogurt	1	USA	3	R	31	31	0																								
Oregon State Dept of Agriculture, 2001	Ice cream	1	USA	3	R	106	106	0																								
Oregon State Dept of Agriculture, 2001	Ice cream mix	1	USA	3	R	57	57	0																								
Oregon State Dept of Agriculture, 2001	Ice cream, novelty	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Ice milk	1	USA	3	R	82	82	0																								
Teufel and Bendzulla, 1993	Ice cream, iced products	1	Germany	1	R?	63	63	0																								
Teufel and Bendzulla, 1993	Ice cream, iced products	1	Germany	1	R?	5	5	0																								
Unilever, 2000	Ice cream	2	Oceania/ Asia/ Africa	3	P	21416	21413	3																								
Unilever, 2000	Ice cream	1	America	3	P	16387	16382	5																								
Unilever, 2000	Ice cream	1	Europe	3	P	99216	99160	56																								
Warke <i>et al.</i> , 2000	Ice creams	2	India	3	R	30	29	1																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
West and North Yorkshire Joint Working Group, 1991	Ice cream	1	UK	1	R	68	65	2								1																
Total=						170391	170129	259								1		2														

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Cultured Milk Products Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Greenwood <i>et al.</i> , 1991	Yogurt	1	UK	1	R?	180	176	3																			1					
McLauchlin and Gilbert, 1990	Yogurt	1	UK	1	?	209	209	0																								
McLauchlin <i>et al.</i> , 1990	Yogurt	1	UK	1	R	2	2	0																								
Ng and Seah, 1995	Yogurt	2	Singapore	2	P/R	40	40	0																								
Oregon State Dept of Agriculture, 2001	Buttermilk	1	USA	3	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Sour cream	1	USA	3	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Yogurt	1	USA	3	R	4	4	0																								
West and North Yorkshire Joint Working Group, 1991	Yogurt	1	UK	1	R	45	45	0																								
Total=						490	486	3																			1					

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

High Fat and Other Dairy Products: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Frye, 2000	Butter	1	USA	3	R	23	23	0																								
Greenwood <i>et al.</i> , 1991	Cream, pasteurized	1	UK	1	R	40	40	0																								
Hartung, 2000a.	milk products	1	Germany	3	R	958	956	2																								
Hartung, 2000a.	milk products,	1	Germany	3	R	6567	6538	29																								
Hartung, 2001	milk products,	1	Germany	3	R	266	264	2																								
Hartung, 2001	milk products,	1	Germany	3	R	537	533	E ⁴									4															
Hartung, 1999	milk products	1	Germany	3	R	45	45	0																								
Hartung, 1999	milk products,	1	Germany	3	R	8732	8552	180																								
Heinitz, 1999	milk product	1	USA	3	P	32	32	0																								
Heinitz, 1999	Milk products (not cheese or ice cream)	1	USA	3	P	271	267	4																								
Karpiskova <i>et al.</i> , 2000	Dairy products	1	Czech Republic	3	R	209	207	2																								
Kozak <i>et al.</i> , 1996	Butter	1	USA	2	P	30	30	0																								
Kozak <i>et al.</i> , 1996	Cream	1	USA	2	P	52	52	0																								
Kozak <i>et al.</i> , 1996	Cream half & half	1	USA	2	P	42	42	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
McLauchlin and Gilbert, 1990	Cream	1	UK	1	?	116	116	0																								
Ng and Seah, 1995	cream	2	Singapore	2	P/R	17	17	0																								
Oregon State Dept of Agriculture, 2001	Pudding, chocolate	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Egg nog	1	USA	3	R	4	4	0																								
Oregon State Dept of Agriculture, 2001	Half & half	1	USA	3	R	7	7	0																								
Oregon State Dept of Agriculture, 2001	Milkshake	1	USA	3	R	55	55	0																								
Oregon State Dept of Agriculture, 2001	Dip	1	USA	3	R	42	40	2																								
Oregon State Dept of Agriculture, 2001	Whipping cream	1	USA	3	R	6	6	0																								
Teufel and Bendzulla, 1993	Butter	1	Germany	1	R?	19	14	E										5														
Teufel and Bendzulla, 1993	Butter	1	Germany	1	R?	97	97	0																								
Total=						18169	17939	221										9														

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Frankfurter Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Hayes <i>et al.</i> , 1992	Hotdogs	1	USA	1	R	40	28	E ⁴			9		1		2																	
Levine, 2000	Hotdogs	1	USA	3	P	1593	1516	77																								
Levine, 2001	Hotdogs	1	USA	3	P	1800	1766	34																								
Ng and Seah, 1995	Franks, chicken & pork	2	Singapore	2	P/R	78	73	5																								
Oregon State Dept of Agriculture, 2001	Hotdog	1	USA	3	R	11	11	0																								
Oregon State Dept of Agriculture, 2001	Hotdogs, beef	1	USA	3	R	3	3	0																								
Oregon State Dept of Agriculture, 2001	Hotdogs, turkey	1	USA	3	R	3	3	0																								
Qvist and Liberski, 1991	Frankfurter	1	Sweden?	1	R	64	56	8																								
Samelis and Metaxopoulos, 1999	Frankfurter, sausage type	1	Greece	3	P	8	8	0																								
Wang and Muriana, 1994	Hotdogs	1	USA	2	R	117	93	16					8																			
Wenger <i>et al.</i> , 1990	Wieners, turkey	1	USA	1	P	46	25	21																								
Total=						3763	3582	161			9		9		2																	

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Dry/Semi-dry Sausage Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Breer and Schopfer, 1989	Salami	1	Australia	1	?	63	59	4																								
Buncic, 1991	Sausage, fermented	1	Yugo-slavia	1	R	21	17	4																								
Cantoni <i>et al.</i> , 1988	Salami & pork, seasoned meat products	1	Italy?	1	R?	225	219	6																								
Choi <i>et al.</i> ,2001	Sausage, fermented	2	Korea	3	R	15	13	2																								
Farber <i>et al.</i> , 1989	Sausages, fermented	1	Canada	1	R	30	24	6																								
Gomez-Campillo <i>et al.</i> , 1999	Cured chorizo	1	Spain	3	R	20	19	1																								
Lahellec <i>et al.</i> , 1996	Sausage, dry	1	France	2	?	116	83	33																								
Lahellec <i>et al.</i> , 1996	Sausage, smoked	1	France	2	?	45	39	6																								
Levine, 2000	Sausages, fermented	1	USA	3	P	352	335	17																								
Levine, 2001	Sausage, dry & semi-dry fermented	1	USA	3	P	856	841	15																								
Oregon State Dept of Agriculture, 2001	Beef Stick	1	USA	3	R	3	3	0																								
Oregon State Dept of Ag, 2001	Pepperoni	1	USA	3	R	7	6	1																								
Oregon State Dept of Agriculture, 2001	Salami	1	USA	3	R	5	5	0																								
Samelis and Metaxopoulos, 1999	Sausage, dry & fermented	1	Greece	3	P	4	4	0																								
Teufel and Bendzulla, 1993	Sausage	1	Germany	1	R?	850	806	44																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Teufel and Bendzulla, 1993	Sausage, cooked & cured	1	Germany	1	R?	338	314	E ⁴										21			3											
Trüssel, 1989	Beef, salami & mettwurst	1	Germany	1	P	99	95	E								4																
Uyttendaele <i>et al.</i> , 1999	Sausage, raw & fermented	1	Belgium	3	R	308	259	36						13																		
Total=						3357	3141	175						13		4		21			3											

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Deli Meats Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Aguado <i>et al.</i> , 2001	Deli meats	1	Spain	3	R	369	335	34																								
Baek <i>et al.</i> , 2000	Ham	2	Korea	3	R	50	50	0																								
Bersot <i>et al.</i> , 2001	Mortadella	2	Brazil	3	R	30	22	8																								
Daley <i>et al.</i> , 1999	Meats, ready- to-eat	1	Canada	3	R	19	18	1																								
Gillespie <i>et al.</i> , 2000	Deli meats	1	UK	3	R	3455	3442	E ⁴										8		5												
Gomez-Campillo <i>et al.</i> , 1999	Cold cuts	1	Spain	3	R	20	20	0																								
Kamat and Nair, 1994	Ham, cooked	2	India	2	R	2	2	0																								
Lahellec <i>et al.</i> , 1996	Ham	1	France	2	?	45	44	1																								
Levine, 2000	Corned beef, roast and cooked	1	USA	3	P	2587	2523	64																								
Levine, 2000	Ham and luncheon meats, sliced	1	USA	3	P	978	930	48																								
Levine, 2000	Poultry, cooked	1	USA	3	P	4125	4036	89																								
Levine, 2000	Sausage, large diameter cooked	1	USA	3	P	2174	2148	26																								
Levine, 2001	Corned beef, roast cooked	1	USA	3	P	1939	1892	47																								
Levine, 2001	Ham- sliced/sliced luncheon	1	USA	3	P	2048	1971	77																								
Levine, 2001	Poultry, cooked	1	USA	3	P	2325	2294	31																								
Levine, 2001	Sausage, large diameter cooked	1	USA	3	P	2725	2712	13																								
Miettinen, <i>et al.</i> , 2001	Broiler products, ready-to-eat	1	Finland	3	P	25	25	0																								
NFPA, 2002	Deli meats	1	USA-CA	3	R	4600	4572	E	10	8			6		1					2								1				
NFPA, 2002	Deli meats	1	USA-MD	3	R	4599	4545	E	32	12			4		1					5												

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Ng and Seah, 1995	Ham/salami/bacon/ luncheon meat	2	Singapore	2	R	17	14	3																								
Ojeniyi <i>et al.</i> , 2000	Turkey breast, smoked	1	Denmark	3	P	2	2	0																								
Ojeniyi <i>et al.</i> , 2000	Turkey breast, cooked smoked	1	Denmark	3	P	18	18	0																								
Ojeniyi <i>et al.</i> , 2000	Turkey cuvette, smoked	1	Denmark	3	P	17	17	0																								
Ojeniyi <i>et al.</i> , 2000	Turkey fillet, smoked & ready-to-eat	1	Denmark	3	P	14	11	3																								
Ojeniyi <i>et al.</i> , 2000	Turkey parts	1	Denmark	3	P	1	1	0																								
Ojeniyi <i>et al.</i> , 2000	Turkey wings	1	Denmark	3	P	1	0	1																								
Ojeniyi <i>et al.</i> , 2000	Turkey, cooked & smoked & diced	1	Denmark	3	P	2	2	0																								
Oregon State Dept of Agriculture, 2001	Beef, barbecue	1	USA	3	R	11	11	0																								
Oregon State Dept of Agriculture, 2001	Chicken, barbecue	1	USA	3	R	4	4	0																								
Oregon State Dept of Agriculture, 2001	Meat, barbecue	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Pork, barbecue	1	USA	3	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Beef	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Bologna	1	USA	3	R	4	4	0																								
Oregon State Dept of Agriculture, 2001	Chicken, breaded	1	USA	3	R	22	22	0																								
Oregon State Dept of Agriculture, 2001	Chicken, ready-to-eat	1	USA	3	R	74	72	2																								
Oregon State Dept of Agriculture, 2001	Corned beef	1	USA	3	R	6	6	0																								
Oregon State Dept of Agriculture, 2001	Ham	1	USA	3	R	56	56	0																								
Oregon State Dept of Agriculture, 2001	Olive loaf	1	USA	3	R	4	4	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Oregon State Dept of Agriculture, 2001	Pastrami	1	USA	3	R	14	14	0																								
Oregon State Dept of Agriculture, 2001	Pork	1	USA	3	R	3	1	2																								
Oregon State Dept of Agriculture, 2001	Beef, roast	1	USA	3	R	108	108	0																								
Oregon State Dept of Agriculture, 2001	Turkey breast, sliced	1	USA	3	R	118	118	0																								
Oregon State Dept of Agriculture, 2001	Turkey ham	1	USA	3	R	8	8	0																								
Oregon State Dept of Agriculture, 2001	Turkey pastrami	1	USA	3	R	8	7	1																								
Oregon State Dept of Agriculture, 2001	Turkey, ready-to-eat	1	USA	3	R	4	4	0																								
Qvist and Liberski, 1991	Ham	1	Sweden?	1	R	80	72	8																								
Qvist and Liberski, 1991	Pork loin	1	Sweden?	1	R	80	62	18																								
Qvist and Liberski, 1991	Sausages	1	Sweden?	1	R	80	72	8																								
Samelis and Metaxopoulos, 1999	Bacon	1	Greece	3	P	4	4	0																								
Samelis and Metaxopoulos, 1999	Ham like products	1	Greece	3	P	4	3	1																								
Samelis and Metaxopoulos, 1999	Ham, sliced & vacuum-packed	1	Greece	3	P	6	5	1																								
Samelis and Metaxopoulos, 1999	Mortadella	1	Greece	3	P	4	4	0																								
Samelis and Metaxopoulos, 1999	Pariza	1	Greece	3	P	2	2	0																								
Samelis and Metaxopoulos, 1999	Pork shoulder, sliced & vacuum-packed	1	Greece	3	P	6	6	0																								
Samelis and Metaxopoulos, 1999	Sausage, country type	1	Greece	3	P	10	9	1																								
Samelis and Metaxopoulos, 1999	Sausage, Emulsion type	1	Greece	3	P	12	12	0																								
Samelis and Metaxopoulos, 1999	Turkey breast, smoked	1	Greece	3	P	4	4	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Soriano <i>et al.</i> , 2001	Beef, ready-to-eat	1	Spain	3	R	5	5	0																								
Soriano <i>et al.</i> , 2001	Chicken, ready-to-eat	1	Spain	3	R	5	5	0																								
Soriano <i>et al.</i> , 2001	Pork, ready-to-eat	1	Spain	3	R	5	5	0																								
Uyttendaele <i>et al.</i> , 1999	Ham, cooked sliced	1	Belgium	3	R	879	817	54					8																			
Total=						33824	33179	542	42	20			10	8	2			8		12								1				

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Pâté and Meat Spreads Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Anderson and Nørrung, 1995	Pâté	1	Denmark	2	R	341	333	6							1					1												
Dominguez <i>et al.</i> , 2001	Pâté	1	Spain	3	R	182	172	E ⁴										9		1												
Gomez-Campillo <i>et al.</i> , 1999	Pâté	1	Spain	3	R	20	20	0																								
Lahellec <i>et al.</i> , 1996	Pâté	1	France	2	?	110	96	14																								
Levine, 2000	Meat spreads	1	USA	3	P	264	254	10																								
Levine, 2000	Pâté	1	USA	3	P	249	244	5																								
Levine, 2001	Meat spreads	1	USA	3	P	105	103	2																								
Levine, 2001	Pâté	1	USA	3	P	103	103	0																								
McLauchlin and Gilbert, 1990	Pâté	1	UK	1	?	696	580	99																		17						
Morris and Ribeiro, 1989	Pâté	1	UK	1	R	73	36	E								18	5			4								3		4	3	
Morris and Ribeiro, 1991	Pâté	1	UK	1	R	216	141	6								42	6			7								4	10			
Nichols <i>et al.</i> , 1998	Pâté, fish & seafood	1	UK	2	R	122	113	1														6		2								
Nichols <i>et al.</i> , 1998	Pâté, meat-based	1	UK	2	R	1804	1767	1														29		1			2		2			2
Nichols <i>et al.</i> , 1998	Pâté, poultry-based	1	UK	2	R	528	511	E														11		2			1		2		1	
Nichols <i>et al.</i> , 1998	Pâté, undefined	1	UK	2	R	380	369	E														9							1			1
Oregon State Dept of Agriculture, 2001	Ham spread	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Pâté, salmon	1	USA	3	R	7	7	0																								
Oregon State Dept of Agriculture, 2001	Pâté, shrimp	1	USA	3	R	1	1	0																								
Oregon State Dept of Agriculture, 2001	Pâté, tuna	1	USA	3	R	1	1	0																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Uyttendaele <i>et al.</i> , 1999	Aspic mince, prepacked, cooked	1	Belgium	3	R	48	43	4						1																		
Uyttendaele <i>et al.</i> , 1999	Aspic mince, unprepackaged & cooked	1	Belgium	3	R	67	66	1																								
Uyttendaele <i>et al.</i> , 1999	Pâté mince, prepacked & cooked	1	Belgium	3	R	217	211	6																								
Uyttendaele <i>et al.</i> , 1999	Pâté mince, unprepackaged & cooked	1	Belgium	3	R	130	123	6						1																		
Total=						5665	5295	161						2	1	60	11	9		13		55		5		17	10	10	9	3	1	3

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated

Deli-type Salad Food Category: Contamination Data						Number of Samples (values in cfu/g units)																										
Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2- 1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Buchanan <i>et al.</i> , 1989	Salad, seafood	1	USA	1	R	2	2	0																								
Hartemink and Georgsson 1991	Salads, seafood	1	Iceland	1	P/R	37	31	6																								
Hartung, 2000a.	Delicatessen salads, other	1	Germany	3	R	485	479	6																								
Hartung, 2001	Delicatessen salads, other	1	Germany	3	R	26	25	1																								
Hartung, 2001	Delicatessen salads, other	1	Germany	3	R	389	374	E ⁴										15														
Hartung, 1999	Delicatessen salads, unspecified	1	Germany	3	R	354	351	3																								
Levine, 2000	Various meat & poultry salads	1	USA	3	P	1645	1594	51																								
Levine, 2001	Salads, deli	1	USA	3	P	630	623	7																								
Lin et al., 1996	Salads(2 egg, 2 cheese, 1dressing)	1	USA	2	R	5	5																									
NFPA, 2002	Salads, deli	1	USA-CA	3	R	4256	4157	E	78	14			4		2													1				
NFPA, 2002	Salad, seafood	1	USA-CA	3	R	1248	1221	E	26	1																						
NFPA, 2002	Salads, deli	1	USA-MD	3	R	4293	4190	E	84	14			5																			
NFPA, 2002	Salad, seafood	1	USA-MD	3	R	1313	1225	E	56	18			10		2				2													
Ng and Seah, 1995	Cole slaw/vegetable salad	2	Singapore	2	R	50	48	2																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-<10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Ng and Seah, 1995	Fish, tuna salad	2	Singapore	2	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Antipasto	1	USA	3	R	3	3	0																								
Oregon State Dept of Agriculture, 2001	Salad, broccoli & cheese	1	USA	3	R	50	50	0																								
Oregon State Dept of Agriculture, 2001	Caesar salad	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Chef salad	1	USA	3	R	31	31	0																								
Oregon State Dept of Agriculture, 2001	Salad, chicken	1	USA	3	R	222	218	4																								
Oregon State Dept of Agriculture, 2001	Cole slaw	1	USA	3	R	161	159	2																								
Oregon State Dept of Agriculture, 2001	Salad, crab	1	USA	3	R	9	9	0																								
Oregon State Dept of Agriculture, 2001	Creamy Fruit	1	USA	3	R	5	5	0																								
Oregon State Dept of Agriculture, 2001	Salad, egg	1	USA	3	R	7	7	0																								
Oregon State Dept of Agriculture, 2001	Salad, Greek	1	USA	3	R	8	8	0																								
Oregon State Dept of Agriculture, 2001	Salad, ham	1	USA	3	R	7	7	0																								
Oregon State Dept of Agriculture, 2001	Salad, macaroni with cheese	1	USA	3	R	194	193	1																								

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Oregon State Dept of Agriculture, 2001	Salad, meat	1	USA	3	R	17	17	0																								
Oregon State Dept of Agriculture, 2001	Salad, pasta	1	USA	3	R	115	115	0																								
Oregon State Dept of Agriculture, 2001	Salad, pea	1	USA	3	R	45	42	3																								
Oregon State Dept of Agriculture, 2001	Salad, potato	1	USA	3	R	302	302	0																								
Oregon State Dept of Agriculture, 2001	Salad, salmon	1	USA	3	R	2	2	0																								
Oregon State Dept of Agriculture, 2001	Salad, seafood	1	USA	3	R	211	211	0																								
Oregon State Dept of Agriculture, 2001	Salad, shrimp	1	USA	3	R	48	48	0																								
Oregon State Dept of Agriculture, 2001	Salad, tortellini	1	USA	3	R	14	14	0																								
Oregon State Dept of Agriculture, 2001	Salad, tuna	1	USA	3	R	16	16	0																								
Oregon State Dept of Agriculture, 2001	Salad, turkey	1	USA	3	R	22	22	0																								
Ryu <i>et al.</i> , 1992	Salad, potato	1	Japan	1	R	3	3	0																								
Scoglio <i>et al.</i> , 2000	Fish marinate & seafood salad	1	Italy	3	R	5	5	0																								
Teufel and Bendzulla 1993	Salad, meat & egg	1	Germany	1	R?	252	241	11																								
Teufel and Bendzulla 1993	Deli, mayonnaise	1	Germany	1	R?	360	333	E									24			3												
Uyttendaele <i>et al.</i> , 1999	Salad, chicken	1	Belgium	3	R	152	110	41					1																			

Reference	Food	Geographic Region ¹	Country	Pub. Date ²	Sample Collection ³	Total # of Samples from the reference	<0.04	≥0.04	>0.01-0.1	>0.1-1	<0.3	0.3-10	<10	≥10	10-100	<20	20-100	<100	>100	100-1000	1E2-1E4	<200	200-500	200-1000	<500	>1000	1E3-1E4	>1E4	1E4-1E5	>1E5	1E5-1E6	>1E6
Uyttendaele <i>et al.</i> , 1999	Salad, fish & shrimp	1	Belgium	3	R	362	249	99						14																		
Uyttendaele <i>et al.</i> , 1999	Salad, ham	1	Belgium	3	R	159	121	33						5																		
Uyttendaele <i>et al.</i> , 1999	Other salad (veg) with mayonnaise	1	Belgium	3	R	201	186	13						2																		
West and North Yorkshire Joint Working Group, 1991	Salad, egg/egg mayonnaise	1	UK	1	R	101	83	E							2	6									10							
West and North Yorkshire Joint Working Group, 1991	Salad, fish	1	UK	1	R	33	32	E							1																	
West and North Yorkshire Joint Working Group, 1991	Salad, meat/egg	1	UK	1	R	15	13	E							1	1																
West and North Yorkshire Joint Working Group, 1991	Salad, fruit/nut	1	UK	1	R	43	42	E							1																	
Total=						17915	17229	283	244	47			19	22	4	5	7	39		2	3					10	1					

¹ Group 1 includes North America including the United States, Canada, Mexico, EU countries, Japan, Australia, New Zealand. Other countries were also included in group 1 on a case-by-case basis if they import the product to the United States. Group 2 includes any country not in group 1.

² 1 = time period pre-1993 to 1993; 2 = time period 1994 to 1998; 3 = time period 1999 to present.

³ R = sample collected at retail; P = sample collected at plant/ manufacturer; ? = location of sample collection unknown.

⁴ E = samples ≥ 0.04 cfu/g that were enumerated