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Growth, Reduction, and Survival of Bacteria on Melon Types[1]

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From 1990 to 2000, over 700 cases of foodborne illness were associated with outbreaks due to melon consumption in the United States and Canada (FDA, 2001). Although there has been an increase in effort to educate industry and consumers of safe handling practices of fresh produce (via Good Agricultural Practices [GAPs] and Good Manufacturing Practices [GMPs]), in the last decade there were still over 1,100 documented illnesses associated with melon consumption (CDC, 2011a). Of 24 outbreaks implicating melon consumption, eight involved watermelon, seven involved cantaloupe, and three involved honeydew. Three cases were due to consuming cantaloupe and/or honeydew, two cases due to consuming cantaloupe and/or watermelon, and one case due to melon consumption of unknown type. Cantaloupes, responsible for at least 11 of the 24 cases, are the source for the majority of the outbreaks (CDC, 2011a). Foodborne pathogens such as Norovirus, *Campylobacter, Shigella,* and *Escherichia coli* O157:H7 are of concern in all of these outbreaks; however, *Salmonella* is reportedly the most prevalent pathogen of concern for melons (CDC, 2011a). As of October 2011, *Listeria monocytogenes* was added to the list of pathogens that could be of concern for melons; a multi-state outbreak of listeriosis involving cantaloupes from a farm in Colorado caused 123 illnesses, 118 hospitalizations, and 25 deaths (CDC, 2011b). These numbers are overwhelming and have proven the significance of melons as a potential vehicle for foodborne pathogens.

Figure 1. *Skin, Flesh, Seeds*
Credits: ©Amanda Rudkin

A variety of factors contribute to the susceptibility of melons becoming contaminated during harvest, packing, and shipping; most of the research currently available focuses on cantaloupes. During growth and development, melons can have direct contact with the soil, which can be a potential source of contamination with human pathogens that may be present in the soil (Richards and Beuchat, 2005b). Rind characteristics also play a role in susceptibility of contamination given that melons may have netted surfaces (cantaloupes), a characteristic that would make it more difficult to remove the pathogen just by washing alone, if contaminated.

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Mechanical damage can also be a problem since melons are quite heavy, and wounds incurred (e.g., punctures, cracks, bruising) make an excellent entry point for pathogens (Fleming et al., 2005). These physical damages, as well as disease, can compromise the outer protection layer of the melon and can allow for contamination of the mesocarp tissue, or flesh (Richards and Beuchat, 2005b). Infiltration and adherence of pathogen at the stem scar tissue is also a possibility that is believed to heighten survival of pathogens in cantaloupe, due to the availability of nutrients and almost neutral pH of the inner flesh (Richards and Beuchat, 2004). Maturity of the melon can also play a role in susceptibility in that ripe melons may allow for better growth and survival of pathogens on their surface (Suslow, 1997). Furthermore, the increased consumption of ready-to-eat commodities such as fresh-cut fruits introduces a new route of microbial contamination: transfer from rind to flesh during cutting. Due to the many factors that may contribute to melon contamination, as well as the numbers of illnesses associated with melons, studies to eliminate bacterial growth on melons have been done to further understand the effectiveness of different sanitizers and food processing techniques.

This document, therefore, is intended to highlight the research that has been done to provide insight on possible sanitation methods and their efficacy in decontaminating melon types of foodborne pathogens as well as natural microflora. Given that melons with netted surfaces such as cantaloupes were implicated in the majority of the outbreaks mentioned above, it follows that cantaloupe was the main concern in a number of the studies reviewed in this table. Bacterial studies included in this table use a variety of sanitizer treatments including chlorine, chlorine dioxide (ClO_2), gaseous ozone, hydrogen peroxide (H_2O_2), nisin, nisin in combination with chelating agents, sodium lactate (NaL), citric acid, acetic acid, and bacteriophages. The studies also use a variety of food processing techniques including different time and temperature combinations and the vacuum-steam-vacuum (VSV) process. (The VSV process, developed and patented by USDA's Agricultural Research Service, entails a short exposure to vacuum to remove insulating fluids, followed by a quick burst of steam intended to transfer energy directly to contaminated sample, then a second exposure to vacuum in order to cool product via evaporation [Ukuku et al., 2006].) Also included are studies with simulation components that mimic commercial distribution and home preparation as well as transfer studies that focus specifically on bacterial transfer from rind to flesh.

The table is organized as follows:

- By melon type, including cantaloupe, honeydew, watermelon, and mixed melons
- By portion of melon used in study, including whole melons, rinds, fresh-cuts, mesocarp tissue (inner tissue, variable distances from the rind), and stem scar tissue
- By bacteria, including *C, amjg, Jgqrcpg_* spp., natural microflora, and *Q_j k m l cjj_* spp.

The intended audience for this document includes melon handlers and processors, researchers, and government officials interested in melon safety:

- During evaluation of current processing and sanitation techniques, melon processors can use the table as a reference as they seek alternative or adaptable technologies.
- Researchers can gain insight as to which direction to take when deciding on new research and technology development for melon safety.
- Government officials can reference this table as current food safety policies and regulations are evaluated and updated.

Information on storage conditions and the efficacy of certain rinsing and scrubbing scenarios are also featured here for the benefit of consumers and educators of consumers. Overall, this review serves as a reference for everyone concerned in the safety of melon consumption.

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Whole	*E. coli* ATCC 25922	Submerged in 4 l of inoculum for 5 min	Air-dried for 1 h on absorbent paper on each side in biosafety cabinet, then stored in plastic tubs lined with absorbent paper at 4°C or 19°C for up to 72 h	4 or 19	5.07, 5.07	24 h	**Heat Treatments:** 1) 24 h control 2) 76°C for 2 min 3) 76°C for 3 min	1) 4.84, 5.14 2) 0.27, 0.10 3) ND, ND Results shown are counts for samples stored at 4°C and 19°C, respectively	CFU/cm^2	Initial counts shown for 4°C and 19°C, respectively	Annous et al., 2004
Cantaloupe, Whole	*E. coli* O157:H7 (C7927, EDL933, and 204P)	100 µl spot inoculated on 5 cm^2 of surface, air dried @ 22°C for 1 h (concentration of bacterial culture: 10^{8-9} CFU/ml)	90–95% RH; melons treated with different levels of ClO_2 gas for up to 10 min		7–8 log CFU/ml		**mg/l of ClO_2 gas:** 0.5 (2 and 10 min) 1.0 (2 and 10 min) 1.5 (2 and 10 min) 3.0 (2 and 10 min) 5.0 (2 and 10 min)	**Reductions:** 0.6, 2.7 1.1, 2.7 1.1, 2.8 2.2, 3.4 2.2, 4.6	$CFU/5\ cm^2$		Mahmoud et al., 2008
Cantaloupe, Whole	*E. coli* O157:H7 (SEA 13B88 and Oklahoma)	Melon was submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min	Dried in biosafety cabinet for 1 h, then stored at 5°C for up to 7 days before antimicrobial treatments	5	5.27	0 or 7 days	**Wash Treatments:** 1) Sterile tap water 2) 2.5% H_2O_2 3) Solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	**Results shown for Day 0:** 1) No significant reduction (data not shown) 2) 3 log reduction 3) 4 log reduction Treatment with HPLNC after Day 7 yielded better results than H_20_2 in reduction of bacterial population. Population of *E. coli* slightly decreased during storage for 7 days.	CFU/cm^2	pH of both wash solutions adjusted to 6.7 by adding 2N NaOH; melons were washed similar to method of inoculation, but only rotated for 5 min	Ukuku et al., 2005
Cantaloupe, Whole	*E. coli* NCTC 10418	Submerged in inoculum (2 concentrations: 10^3 and 10^6) solution for 5 min, dried for 1 h at 20°C ± 2°C	Stored for 7 d at 8°C (stored to simulate commercial distribution in Australia); placed in an open bag to allow for high RH	8	2.26	7 d	n/a	1.04 Results shown for the high inoculum concentration	CFU/cm^2		Behrsing et al., 2003

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Whole	*Listeria innocua* 2305	Submerged in inoculum (2 concentrations: 10^3 and 10^6) solution for 5 min, dried for 1 h at 20°C ± 2°C	Stored for 7 d at 8°C (stored to simulate commercial distribution in Australia); placed in an open bag to allow for high RH	8	3.53	7 d	n/a	5.46 Results shown for the high inoculum concentration	CFU/cm^2		Behrsing et al., 2003
Cantaloupe, Whole	*Listeria monocytogenes* (Scott A, F5069, and LCDC 81-861)	100 µl spot inoculated on 5 cm^2 of surface, air dried at 22°C for 1 h (concentration of bacterial culture: 10^{8-9} CFU/ml)	90–95% RH; melons treated with different levels of ClO_2 gas for up to 10 min		7–8 log CFU/ml		**mg/l of ClO_2 gas:** 0.5 (2 and 10 min) 1.0 (2 and 10 min) 1.5 (2 and 10 min) 3.0 (2 and 10 min) 5.0 (2 and 10 min)	**Reductions:** 1.2, 3.3 1.8, 3.2 2.1, 3.7 2.1, 3.8 2.2, 4.3	$CFU/5\ cm^2$		Mahmoud et al., 2008
Cantaloupe, Whole	*Listeria monocytogenes* (Scott A and CCR1-L-G)	Submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min	Dried in biosafety cabinet for 1 h, then stored at 5°C for up to 7 days before treatments	5	4.07	0 or 7 days	**Wash Treatments:** 1) Sterile tap water 2) 2.5% H_2O_2 3) Solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	**Results shown for Day 0:** 1) No significant reduction (data not shown) 2) 3 log reduction 3) None detected Treatment with HPLNC after Day 7 yielded better results than H_20_2 in reduction of bacterial population. Population of *L. mono* remained the same during storage for 7 days.	CFU/cm^2	pH of both wash solutions adjusted to 6.7 by adding 2N NaOH melons were washed similar to method of inoculation, but only rotated for 5 min	Ukuku et al., 2005

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Whole	*Listeria monocytogenes* (Scott A, ATCC 15313, H7778, and CCR1-L-G)	Submerged in 3 l of inoculum (10^8 CFU/ml), w/ agitation by glove-covered hand for 10 min, dried for 1 h	Whole cantaloupes were divided into 2 groups: ½ was untreated and other ½ was treated with 70% ETOH, (treated by submerging melon into ETOH solution for 1 min)	5		24 h	**Wash Treatments:** 1) Sterile tap water 2) 1000 ppm chlorine 3) 5% H_2O_2	ETOH treated cantaloupes with Treatment (2) and (3) reduced *L. mono* below detection limit (2 CFU/cm^2), (3- or 4-log reduction).	CFU/cm^2		Ukuku and Fett, 2002
Cantaloupe, Whole	Natural microflora	n/a	Immersed in 5 l of either water or dilute acetic acid for 1 min		6.7		1) Water (25°C) 2) Water (95°C) 3) Acetic Acid (25°C) 4) Acetic Acid (95°C)	1) 6.3 2) 3.7 3) 6.0 4) 3.3	CFU/cm^2 of surface rind	Final counts shown reflect an average of APC counts from 4 different sampling sites	Fouladkhah and Avens, 2010
Cantaloupe, Whole	Natural microflora (total coliforms)	n/a	Treated with gaseous ozone and submerged in hot water (75°C)		2.3		1) 10,000 ppm O_3/30 min 2) 10,000 ppm O_3/ 30 min + CO_2 3) Hot H_20 (75°C/1 min) 4) Hot H_20 (75°C/1 min) + 10,000 ppm O_3/30 min	1) 1.0 2) 1.2 3) 0.0 4) 0.0	CFU/g of rind		Selma et al., 2008a
Cantaloupe, Whole	Natural microflora (mesophilic bacteria)	n/a	Air-dried, treated with chlorine dioxide gas, packaged in plastic clamshell containers, wrapped in PVC film	22	4.2 6.3 7.3 7.5 8.2	0 days 3 days 6 days 9 days 12 days	5.0 mg/l (2 and 10 min)	3.0, 2.3 4.9, 3.8 5.3, 4.0 5.6, 4.8 6.0, 5.8	CFU/cm^2		Mahmoud et al., 2008

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Cantaloupe, Whole	Natural microflora (mesophilic bacteria)	n/a	Treated with gaseous ozone and submerged in hot water (75°C)		5.9		1) 10,000 ppm O_3/30 min 2) 10,000 ppm O_3/30 min + CO_2 3) Hot H_20 (75°C/1 min) 4) Hot H_20 (75°C/1 min) + 10,000 ppm O_3/30 min	1) 4.8 2) 4.4 3) 3.3 4) 2.1	CFU/g of rind		Selma et al., 2008a
Cantaloupe, Whole	Natural microflora (molds)	n/a	Treated with gaseous ozone and submerged in hot water (75°C)		2.2		1) 10,000 ppm O_3/30 min 2) 10,000 ppm O_3/30 min + CO_2 3) Hot H_20 (75°C/1 min) 4) Hot H_20 (75°C/1 min) + 10,000 ppm O_3/30 min	1) 0.7 2) 0.5 3) 0.3 4) 0.0	CFU/g of rind		Selma et al., 2008a
Cantaloupe, Whole	Natural microflora (psychrotrophic bacteria)	n/a	Air-dried, treated with chlorine dioxide gas, packaged in plastic clamshell containers, wrapped in PVC film	22	3.6 3.9 4.9 5.8 6.4	0 days 3 days 6 days 9 days 12 days	5.0 mg/l (2 and 10 min)	ND, ND 2.8, ND 3.2, ND 4.0, ND 4.5, 2.3	CFU/cm^2		Mahmoud et al., 2008
Cantaloupe, Whole	Natural microflora (psychrotrophic bacteria)	n/a	Treated with gaseous ozone and submerged in hot water (75°C)		5.6		1) 10,000 ppm O_3/30 min 2) 10,000 ppm O_3/ 30 min + CO_2 3) Hot H_20 (75°C/1 min) 4) Hot H_20 (75°C/1 min) + 10,000 ppm O_3/30 min	1) 4.3 2) 4.4 3) 1.3 4) 0.5	CFU/g of rind		Selma et al., 2008a

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Whole	Natural microflora (mesophilic aerobes, YM, and *Pseudomonas* spp.)	n/a	Cantaloupes individually placed in Vacuum-Steamed-Vacuum (VSV) processor with 138°C saturated steam for 0.1 s		6.39 3.09 2.89		VSV treatment – 2 and 3 cycles	**Reductions:** ~1 log ~2 log ~1 log Results shown for mesophilic aerobes, YM, and *Pseudomonas* spp., respectively	CFU/cm^2	Initial Counts for mesophilic aerobes, YM, and *Pseudomonas* spp., respectively	Ukuku et al., 2006
Cantaloupe, Whole	Natural microflora	n/a	Stored at 4°C prior to surface pasteurization treatment at indicated temp. and time	4	6.18		**Heat Treatments:** 1) 96°C for 2 min 2) 86°C for 2 min 3) 76°C for 2 min 4) 76°C for 3 min	1) 3.88 2) 4.24 3) 3.88 4) 4.00	CFU/cm^2		Annous et al., 2004
Cantaloupe, Whole	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	n/a	n/a	n/a	n/a	n/a	n/a	6.6, 2.8, 2.9 Results for mesophiles, YM, and *Pseudomonas* spp., respectively	CFU/cm^2		Ukuku and Sapers, 2007
Cantaloupe, Whole	*Salmonella* Poona	100 µl spot inoculated on 5 cm^2 of surface, air dried at 22°C for 1 h (concentration of bacterial culture: 10^{8-9} CFU/ml)	90%–95% RH; melons treated with different levels of ClO_2 gas for up to 10 min		7–8 log CFU/ml		**mg/l of ClO_2 gas:** 0.5 (2 and 10 min) 1.0 (2 and 10 min) 1.5 (2 and 10 min) 3.0 (2 and 10 min) 5.0 (2 and 10 min)	**Reductions:** 0.9, 3.2 1.2, 3.5 1.5, 4.7 3.2, >5 3.2, >5	$CFU/5\ cm^2$		Mahmoud et al., 2008
Cantaloupe, Whole	*Salmonella* Poona RM 2350	Submerged in 4 l of inoculum for 5 min	Air-dried for 1 h on absorbent paper on each side in biosafety cabinet, then stored in plastic tubs lined with absorbent paper at 4°C or 19°C for up to 72 h	4 or 19	3.66, 3.66	24 h	**Heat Treatments:** 1) 24-hr control 2) 76°C for 3 min 3) RT wash for 3 min	1) 3.31, 5.54 2) 0.10, 0.16 3) 4.23, 5.08 Results shown are counts for samples stored at 4°C and 19°C, respectively.	CFU/cm^2	Initial count for 4 and 19°C, respectively	Annous et al., 2004

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Cantaloupe, Whole	*Salmonella* Poona RM 2350	Submerged in 4 l of inoculum for 5 min	Air-dried at either 4°C or 19°C for up to 72 h	4 or 19		2 h 24 h 48 h 72 h	Effect of storage temperature on survival	4.26, 4.26 6.72, 3.40 6.95, 3.08 7.02, 3.37 Results shown are for storage temperature of 4°C and 19°C (2 h, 24 h, 48 h, 72 h).	CFU/cm^2		Annous et al., 2004
Cantaloupe, Whole	*Salmonella* Salford IMB 1710	Submerged in inoculum (2 concentrations: 10^3 and 10^6) solution for 5 min, dried for 1 h at 20 ± 2°C	Stored for 7 d at 8°C (stored to simulate commercial distribution in Australia); placed in an open bag to allow for high RH	8	2.08	7 d	n/a	1.78 Results shown for the high inoculum concentration	CFU/cm^2		Behrsing et al., 2003
Cantaloupe, Whole	*Salmonella* Stanley H0558	Submerged in 3 l of inoculum (10^8 CFU/ml), w/ agitation by glove-covered hand for 10 min, dried for 1 h	Washed melons were submerged in wash solution with manual rotation for 5 min, dried on crystallizing dish for 1 h	4 and 20	3.8	0 h 24 h 72 h 120 h 144 h	**Wash Treatments:** 1) Sterile tap water 2) 1000 ppm chlorine 3) 5% H_2O_2	1) No significant reduction at either temp. 2) (4°C) – 3.4 log reduction at 0 and 24 h, less reduction at all times thereafter; (20°C) – 3 log reduction at 0 h, declined at all times thereafter 3) (4°C) – 3.2 and 1.6 log reductions at 0 h and 24 h, respectively, 0.8–0.9 log reduction at all times thereafter; (20°C) – 3 log reduction @ 0 h, declined at all times thereafter	CFU/cm^2		Ukuku and Sapers, 2001
Cantaloupe, Whole	*Salmonella* (Stanley H0558, Newport H1275, Anatum F4317, Infantis F4319, and Poona RM2350)	Submerged in 3 l of inoculum cocktail (10^8 CFU/ml), rotated with a glove-covered hand for 10 min	Air-dried, melons were dipped into 3 l of sanitizer solutions with manual rotating for 5 min	5	4.76	0, 3, or 7 days	**Wash Treatments:** 1) Sterile tap water 2) nisin-EDTA 3) nisin-NaL 4) NaL-KS 5) nisin-NaL-KS	4.54, 4.44, 4.36* 1.66, 2.59, 2.66 1.50, 2.52, 2.46 1.40, 2.40, 2.36 1.70, 2.66, 2.70 1.32, 2.22, 2.26 Results shown for Days 0, 3, and 7, respectively	CFU/cm^2	*Day 0: all combination treatments reduced *Salmonella* by 3 logs; no significant reductions for melons stored for 3 or 7 days	Ukuku and Fett, 2004

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Whole	*Salmonella* (Poona RM2350, Stanley H0558, Newport H1275, Anatum F4317, Infantis F4319)	Submerged in 3 l of inoculum (8.3 x 10^8 CFU/ml) for 10 min w/out agitation	Cantaloupes placed on a crystallizing dish to air dry for 1 h, stored at 5 or 20°C for up to 5 days	5 or 20	4.7	Data shown for 8 h post-inoculation	**Wash Treatments:** 1) Water (70°C) 2) 5% H_2O_2 (70°C) 3) Water (97°C)	1) 2.6 2) 0.9 3) 1.1 *Salmonella* population (on rind surface) declined slightly at 5°C and increased slightly at 20°C during the 5-day storage (data not shown in paper).	CFU/cm^2	Treatment was carried out ~8 h after inoculation and applied for 60 s	Ukuku et al., 2004
Cantaloupe, Whole	*Salmonella* (Poona RM2350, Stanley H0558, Newport H1275, Anatum F4317, Infantis F4319)	Submerged in 3 l of inoculum (~20 °C) of 3 concentrations (10^3, 10^6, 10^8 CFU/ml) for 10 min w/out agitation	Cantaloupes placed on a crystallizing dish to air dry for 1 h	20	1) 4.7 2) 3.5 3) 1.9	3 days	**3 different inoculum levels (CFU/ml):** 1) 10^8 2) 10^6 3) 10^3	1) 2.7, 0.8, 1.3 2) 1.1, +, + 3) +, - , - Results shown are for H_2O (70°C), H_2O_2 (70°C), and H_2O (97°C), respectively, for each level (see comments).	CFU/cm^2	(+) Means positive after enrichment (-) Means negative after enrichment	Ukuku et al., 2004
Cantaloupe, Fresh-cut	*E. coli* O157:H7 LJH537	200 µl of 10^4, 10^5, 10^6, 10^7, 10^8, 10^9 CFU/ml on surface of rind of whole melon (Transference of pathogen during cutting)	Melons cut through point of inoculation and rind removed, transference determined by TSA-Kan plates, visualization of green fluorescence on flesh melon cubes under UV-light and PCR analysis					Fresh-cut pieces inoculated with 4.3 to 8.3 log were all positive for *E. coli*; pieces inoculated with 3.3 log were negative for *E. coli.*	CFU/rind	Results for fresh-cut pieces were consistently positive or negative by all methods.	Selma et al., 2008a
Cantaloupe, Fresh-cut	*E. coli* O157:H7 (SEA 13B88 and Oklahoma)	Whole melon submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min (Transference of pathogen during cutting)	Inoculated whole melons cut into 4 sections, rinds removed, and interior flesh cut into ~3 cm cubes	5		0 or 7 days	**Wash Treatments:** 1) Sterile tap water 2) 2.5% H_2O_2 3) Solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	1) 6, 6 2) 1 (2), 3 (3) 3) 0 (0), 1 (1) Numbers listed represent # of melons (rinds) out of 6 that were positive for pathogen at Days 0 and 7, respectively. See comments for #'s in parentheses.		#'s enclosed in parentheses represent fresh-cut pieces that were negative by direct plating but positive after enrichment	Ukuku et al., 2005

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Fresh-cut	*E. coli* O157:H7 (204P, 301C, 505B, 45753-35)	Pieces placed in stomacher bags and inoculated 1.0 ml of 10^4 cocktail (method not specified)	Rinds sanitized before cutting, flesh cut into 2-cm cubes	5 or 25	Not specified	up to 34 h	Cubes held at 5°C or 25°C for up to 34 h	Watermelon cubes incubated at 25°C supported growth better than cantaloupe. Significant ($p<0.05$) increases in population occurred b/t 4 and 6 h. Population reached 6.81 log after 28 h incubation at 25°C. No significant change in population on cubes held at 5°C.	CFU/g of melon	Watermelon pH 5.56; Cantaloupe pH 7.01 Article has hand-drawn graph of growth at various time intervals up to 34 h	Delrosario and Beuchat, 1995
Cantaloupe, Fresh-cut	*E. coli* O157:H7 (B6914 gfp 86)	25 µl of inoculum (6.15 log CFU/ml was added to each melon well	Rind of whole melons sprayed with 80% ETOH, melon was cut in ½ and seeds removed by gloved hand, 1 cm thick slices were cut with a deli-slicer, each slice cut into ~25 mm wedges by knife, metal cork borer (0.5 cm diam.) used to make a well in each wedge	4		0, 2, 5, 7 days	ECP-100 is a bacteriophage cocktail composed of 3 *E. coli* O157:H7-specific lytic bacteriophages (ECML-4, ECML-117, and ECML-134). Phages were mixed in phosphate-buffered saline (pH 7.4); final concentration was 8.3 log PFU/ml in PBS; 25 µl of ECP-100 was applied via pipette.	**Control:** 3.74, 3.34, 3.23, 3.46 **Treated with ECP-100:** 3.53, 0.77, 1.28, 0.96 Results shown in each group represent Days 0, 2, 5, and 7.	CFU/ml	Samples were placed in commercial, 530 ml domed plastic fruit bowls	Sharma et al., 2009

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Fresh-cut	*E. coli* O157:H7 (B6914 gfp 86)	25 µl of inoculum (6.15 log CFU/ml was added to each melon well	Rind of whole melons sprayed with 80% ETOH, melon was cut in ½ and seeds removed by gloved hand, 1-cm thick slices were cut with a deli-slicer, each slice cut into ~25 mm wedges by knife, metal cork borer (0.5 cm diam.) used to make a well in each wedge	20		0, 2, 5, 7 days	ECP-100 is a bacteriophage cocktail composed of 3 *E. coli* O157:H7-specific lytic bacteriophages (ECML-4, ECML-117, and ECML-134). Phages were mixed in phosphate-buffered saline (pH 7.4); final concentration was 8.3 log PFU/ml in PBS; 25 µL of ECP-100 was applied by pipette.	**Control:** 3.74, 7.53, 7.83, 8.36 **Treated with ECP-100:** 3.53, 6.17, 6.59, 6.99 Results shown in each group represent Days 0, 2, 5, and 7.	CFU/ml	Samples were placed in commercial, 530 ml domed plastic fruit bowls	Sharma et al., 2009
Cantaloupe, Fresh-cut	*Listeria monocytogenes* (Scott A and CCR1-L-G)	Whole melon submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min (Transference of pathogen during cutting)	Inoculated whole melons cut into 4 sections, rinds removed, and interior flesh cut into ~3 cm cubes	5		0 or 7 days	**Wash Treatments:** 1) Sterile tap water 2) 2.5% H_2O_2 3) Solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	1) 6, 6 2) 0 (1), 1 (3) 3) 0 (0), 0 (0) Numbers listed represent # of melons (rinds) out of 6 that were positive for pathogen at Day 0 and Day 7, respectively. See comments for #'s in parentheses.		#'s in parentheses represent fresh-cut pieces that were negative by direct plating but positive after enrichment	Ukuku et al., 2005
Cantaloupe, Fresh-cut	*Listeria monocytogenes* (Scott A, ATCC 15313, H7778, and CCR1-L-G)	Fresh-cut pieces were immersed in 3 l of inoculum (10^6 CFU/ml) for 30 s	Melon flesh was surface sanitized by dipping in Cl or H_2O_2 solution for 5 min and cut into 3-cm cubes prior to inoculation	4, 8, 20	3.5	Up to 15 days		**4°C**: *L. monocytogenes* survived but did not grow for up to 15 days **8°C and 20°C**: Population reached 4.86 logs at 15 days	CFU/g	Growth evident at 8 and 20°C but there was an observed lag time for both: 6 h and 4 h, respectively	Ukuku and Fett, 2002

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Fresh-cut	*Listeria monocytogenes* (Scott A, ATCC 15313, H7778, and CCR1-L-G)	Whole melon submerged in 3 l of inoculum (10^8 CFU/ml), w/ agitation by glove-covered hand for 10 min, (Transference of pathogen during cutting)	Melons were cut into 4 sections. Each section was further cut, rinds removed, then ~100g of interior flesh placed into stomacher bag.	4	3.5 (on rind)	0, 1, 5, 10, 15 days	**Wash Treatments:** 1) Sterile tap water 2) 1000 ppm chlorine 3) 5% H_2O_2	Water-washed samples had growth of *L. monocytogenes* at 0, 1, and 5 days (after enrichment), but not on Days 10 and 15. Chlorine- and H_2O_2-washed samples did not have growth at any measured interval.	CFU/cm^2	Control sample also did not have growth of *L. monocytogenes* on Days 10 and 15	Ukuku and Fett, 2002
Cantaloupe, Fresh-cut	Natural microflora (mesophilic bacteria)	Transference of pathogen during cutting	Cubes placed in a 3-pocket tub tall plastic bowl	5 and 10		3 days 6 days 9 days	VSV treatment – 2 and 3 cycles	No significant reductions	CFU/g		Ukuku et al., 2006
Cantaloupe, Fresh-cut	Natural microflora (YM)	Transference of pathogen during cutting	Cubes placed in a 3-pocket tub tall plastic bowl	5 and 10		3 days 6 days 9 days	VSV treatment – 2 and 3 cycles	Reduced to below levels of detections (<1 CFU/g); not recovered for up to 3 days at 5°C, but showed up at Day 6 and Day 9	CFU/g		Ukuku et al., 2006
Cantaloupe, Fresh-cut	Natural microflora (*Pseudomonas* spp.)	Transference of pathogen during cutting	Cubes placed in a 3-pocket tub tall plastic bowl	5 and 10		3 days 6 days 9 days	VSV treatment – 2 and 3 cycles	No significant reductions	CFU/g		Ukuku et al., 2006
Cantaloupe, Fresh-cut	Natural microflora (total plate count [TPC])	Transference of pathogen during cutting	Whole cantaloupes sanitized by submerging into water under 3 different conditions; melons then peeled (w/ mechanical peelers) and cubed	4	n/a	Up to 20 days	**Submersion Conditions:** 1) 10°C for 20 min 2) 20 ppm chlorine solution at 10°C for 20 min (pH 6.5) 3) 76°C for 3 min Total plate count plated on TSA (tryptic soy agar). Final counts for each condition under each trial are for Days 1, 6, 8, 10, 13, 16, and 20, respectively.	**Trial 1:** 1) 2.9, 3.3, 3.1, 3.4, 3.3, 3.5, 4.2 2) 3.2, 3.4, 3.3, 3.1, 3.0, 3.5, 3.6 3) 3.9, 3.4, 3.4, 3.4, 3.8, 3.6, 3.8 **Trial 2:** 1) 3.1, 3.8, 4.2, 4.9, 6.3, 6.9, 7.9 2) 2.9, 3.5, 4.3, 4.8, 5.6, 6.9, 7.8 3) 2.9, 2.3, 3.9, 2.9, 3.6, 2.8, 5.0 **Trial 3:** 1) 2.8, 4.3, 4.8, 5.8, 7.3, 7.4, 8.0 2) 2.6, 3.9, 4.9, 6.0, 6.5, 7.4, 7.3 3) 3.2, 2.4, 3.0, 2.7, 3.2, 3.8, 4.6	CFU/g	Samples also analyzed for appearance, aroma, firmness, color, soluble solids content, fluid loss, ascorbic acid content, and headspace O_2 and CO_2 w/in the packages	Fan et al., 2008

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Fresh-cut	Natural microflora (Yeast and Molds [YM])	Transference of pathogen during cutting	Whole cantaloupes sanitized by submerging into water under 3 different conditions; melons then peeled (w/ mechanical peelers) and cubed	4	n/a	Up to 20 days	**Submersion Conditions:** 1) 10°C for 20 min 2) 20 ppm chlorine solution at 10°C for 20 min (pH 6.5) 3) 76°C for 3 min YM plated on Yeast and Mold Petrifilm. Final counts for each condition under each trial are for Days 1, 6, 8, 10, 13, 16, and 20, respectively.	**Trial 1:** 1) 2.2, 2.0, 2.3, 2.7, 2.0, 2.2, 3.2 2) 2.1, 2.5, 2.6, 2.5, 2.0, 2.6, 2.4 3) 2.5, 1.9, 1.7, 2.3, 2.2, 2.7, 2.3 **Trial 2:** 1) 2.3, 2.8, 2.6, 2.7, 2.9, 3.2, 3.4 2) 1.9, 2.0, 2.3, 2.2, 1.4, 1.8, 2.2 3) 2.2, 0.9, 1.7, 1.1, 1.3, 1.7, 1.9 **Trial 3:** 1) 2.0, 3.0, 2.7, 3.5, 3.3, 3.0, 3.6 2) 1.9, 2.7, 2.9, 4.0, 3.6, 3.2, 3.8 3) 1.5, 2.1, 1.9, 2.2, 1.5, 1.7, 1.1	CFU/g	Samples also analyzed for appearance, aroma, firmness, color, soluble solids content, fluid loss, ascorbic acid content, and headspace O_2 and CO_2 w/in the packages	Fan et al., 2008
Cantaloupe, Fresh-cut (ripe)	Natural microflora (coliforms, LAB, *P. fluorescens,* and yeasts)		After cutting, cubes stored at 5°C for 30 min, then treated (or left untreated) with gaseous ozone and packaged in polypropylene (PP) containers with passive MAP	5	2.7, 2.9, 4.4, 3.9	4 days 7 days	**Gaseous Ozone Conditions:** 1) 5000 ppm/30 min 2) 20,000 ppm/30 min	1) 1.6, 2.4, 4.0, 3.4 2) – ,1.0, – , – Initial and final counts shown for coliforms, LAB, *P. fluorescens*, and yeasts, respectively	CFU/cube		Selma et al., 2008b
Cantaloupe, Fresh-cut (non-ripe)	Natural microflora (coliforms, LAB, *P. fluorescens,* and yeasts)		After cutting, cubes stored at 5°C for 30 min, then treated (or left untreated) with gaseous ozone and packaged in polypropylene (PP) containers with passive MAP	5	0.5–0.7 log lower than ripe melons except for LAB	4 days 7 days	**Gaseous Ozone Conditions:** 20,000 ppm/30 min	On Day 7, with the 20,000 ppm/30 min of ozone treatments, counts were lowered by 1.6, 1.6, 0.7, and 1.1 logs from the initial counts.	CFU/cube		Selma et al., 2008b

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Fresh-cut	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	n/a	n/a	n/a	n/a	n/a	n/a	3.2, 0.6, 0.8 Results for mesophiles, YM, and *Pseudomonas* spp., respectively	CFU/g		Ukuku and Sapers, 2007
Cantaloupe, Fresh-cut	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	Transference of pathogen during cutting	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; pieces were then left out at 22°C for 5 h, then refrigerated at 5°C for 3 h	n/a	n/a	n/a	n/a	Mesophiles increased ~1 log; Yeast and mold increased from 0.6 to 1.3 logs; *Pseudomonas* spp. increased ~1 log	CFU/g		Ukuku and Sapers, 2007
Cantaloupe, Fresh-cut	*Salmonella* Stanley H0558	Whole melon submerged in 3 l of inoculum (10^8 CFU/ml), w/ agitation by glove-covered hand for 10 min, dried for 1 h (Transference of pathogen during cutting)	Pieces treated w/ chlorine and hydrogen peroxide were analyzed for presence of *Salmonella* through pre-enrichment steps	4	0.21, 0.23, 0.22, 0.22	0, 1, 3, 5 days	**Wash Treatments:** 1) Sterile tap water 2) 1000 ppm chlorine 3) 5% H_2O_2 Pieces treated with chlorine and H_2O_2 were done so within 24 h of inoculation.	1) 0.21, 0.20, 0.20, 0.23 2) BD, BD, 0.12, 0.18 3) BD, BD, 0.16, 0.20 Results shown for Days 0, 1, 3, 5, respectively, for each wash treatment	CFU/g	Initial counts are shown for Days 0, 1, 3, 5, respectively BD – below detectable limits (<0.1 CFU/g)	Ukuku and Sapers, 2001
Cantaloupe, Fresh-cut	*Salmonella* Stanley H0558	Whole melon submerged in 3 l of inoculum (10^8 CFU/ml), w/ agitation by glove-covered hand for 10 min, dried for 1 h (Transference of pathogen during cutting)	Pieces treated w/ chlorine and hydrogen peroxide were analyzed for presence of *Salmonella* through pre-enrichment steps	20	0.22, 0.21, 0.24, 0.20	0, 1, 3, 5 days	**Wash Treatments:** 1) Sterile tap water 2) 1000 ppm chlorine 3) 5% H_2O_2 Pieces treated with chlorine and H_2O_2 were done so within 24 h of inoculation.	1) 0.20, 0.20, 0.21, 0.22 2) BD, BD, 0.14, 0.18 3) BD, BD, 0.18, 0.14 Results shown for Days 0, 1, 3, 5, respectively, for each wash treatment	CFU/g	Initial counts shown for Days 0, 1, 3, 5, respectively. BD – below detectable limits (<0.1 CFU/g)	Ukuku and Sapers, 2001

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Fresh-cut	*Salmonella* Stanley H0558	Fresh-cut cubes were dipped in inoculum, concentration of 10^4 or 10^6 CFU/ml for 1 min	Melon flesh was surface-sanitized by dipping in Cl or H_2O_2 solution for 5 min and cut into 3-cm cubes prior to inoculation.	4, 8 or 20	10^2 to 10^3	up to 14 days (examined every 2 days)	**Wash Treatments:** 1) Sterile tap water 2) 1000 ppm chlorine 3) 5% H_2O_2	**4°C**: all pieces positive on Day 8 and thereafter **8°C**: all pieces positive on Day 4 and thereafter **20°C**: all pieces positive at Day 2 and Day 4* *For 20°C, study terminated after Day 4 due to presence of slime, odor, and mold	CFU/g	Below detectable limits for non-specified days	Ukuku and Sapers, 2001
Cantaloupe, Fresh-cut	*Salmonella* (Stanley H0558, Newport H1275, Anatum F4317, Infantis F4319, and Poona RM2350)	Whole melon submerged in 3 l of inoculum cocktail (10^8 CFU/ml), rotated with a glove-covered hand for 10 min (Transference of pathogen during cutting)	Air-dried	5	1.96, 2.31, 2.66	0, 3, or 7 days	**Wash Treatments:** 1) nisin-EDTA 2) nisin-NaL 3) nisin-KS 4) NaL-KS 5) nisin-NaL-KS	**Only detectable on Day 7:** 1) .48 2) .35 3) .51 4) .23 5) ND	CFU/g	Initial counts shown for Days 0, 3, and 7, respectively	Ukuku and Fett, 2004
Cantaloupe, Fresh-cut	*Salmonella* (Stanley H0558, Newport H1275, Anatum F4317, Infantis F4319, and Poona RM2350)	Fresh-cut pieces dipped in inoculum cocktail (10^6 CFU/ml) for 2 min	Cut from uninoculated whole melons; inoculated pieces placed in a basket to dry for 3 h before sanitizing, then washed for 1 min with sanitizing solutions; stored in bags after sanitized	5	3.42, 3.91, 4.46	0, 3, or 7 days	**Wash Treatments:** 1) Sterile tap water 2) nisin-EDTA 3) nisin-NaL 4) nisin-KS 5) NaL-KS 6) nisin-NaL-KS Pieces washed for 1 min with respective solutions	1) 3.02, 3.85, 4.58 2) 3.07, 3.15, 3.18 3) 2.62, 2.69, 2.58 4) 2.82, 2.88, 2.78 5) 2.40, 2.49, 2.52 6) 2.02, 2.25, 2.18 Results shown for Days 0, 3, and 7, respectively	CFU/g	Initial counts shown for Days 0, 3, 7, respectively Nisin-NaL-KS was most effective for reducing *Salmonella*, and had significant differences in reduction from all other sanitizing solutions	Ukuku and Fett, 2004

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Fresh-cut	*Salmonella* (Poona RM2350, Stanley H0558, Newport H1275, Anatum F4317, and Infantis F4319)	Whole melon submerged in 3 l of inoculum (8.3 × 10^8 CFU/ml) for 10 min w/out agitation	Wash treatments carried out 3 days post-inoculation; fresh-cut pieces prepared and sampled immediately after wash treatments	5	4.7, 2.9	3 days	**Wash Treatments:** 1) Water (70°C) 2) 5% H_2O_2 (70°C) 3) Water (97°C) Treatments applied for 60 s	1) 2.6, 0.7 2) 0.9, + 3) 1.1, + Results shown for whole and fresh-cut, respectively	CFU/cm^2	Initial counts shown for whole and fresh-cut, respectively (+) Means positive after enrichment	Ukuku et al., 2004
Cantaloupe, Fresh-cut	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed inside a 9.75-inch diameter, 3-pocket, plastic bowl	5, 10, and 22	2.2	Up to 12 days		**5°C:** No significant decline after 12 d **10°C:** Increased to 3.6 log by Day 12 **22°C:** Plateaued at Day 2 and declined to below initial populations thereafter		Whole melons were individually washed under running tap water (19°C) for 5 min to mimic home preparation before cut	Ukuku and Sapers, 2007
Cantaloupe, Fresh-cut	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5 CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed inside a 9.75-inch diameter, 3-pocket, plastic bowl	5 and/ or 22			1) Stored at 5°C immediately after preparation 2) Held at 22°C for 3 h before storage at 5°C 3) Held at 22°C for 5 h before storage at 5°C 4) Held at 5°C for 3 h, after preparation	1) 2.2 2) 2.5 3) 3.5 4) 1.9	CFU/g		Ukuku and Sapers, 2007

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind	*E. coli* O157:H7 (204P, 301C, 505B, 45753-35)	7 areas (2–3 cm in diameter) delineated on rind	0.1 ml of inoculum (10^2 log CFU/ml) pipetted in each of the 7 areas on rind, melons held in covered plastic boxes until enumeration; RH 93% ± 5%	5 or 25	Not specified	Up to 21 days		**25°C:** Significant ($p<0.05$) increases in population w/in 4 days, then remained constant thereafter Growth more prolific on cantaloupe than watermelon rind **5°C:** Significant decreases w/in 4 days $<10^1$ recovered after 8 days	CFU/cm^2 of rind surface	Inoculated areas remained wet throughout incubation due to high RH	Delrosario and Beuchat, 1995
Cantaloupe, Rind	Natural microflora (total plate count [TPC]; yeast and molds [YM])	n/a	Whole cantaloupes sanitized by submerging into water under 3 different conditions	10 or 76	**Trial 1:** 1) 5.3 2) 4.2 **Trial 2:** 1) 5.4 2) 4.4 **Trial 3:** 1) 4.6 2) 4.9 TPC (1) and YM (2)	n/a	**Submersion Cond.:** 1) 10°C for 20 min 2) 20 ppm chlorine solution at 10°C for 20 min (pH 6.5) 3) 76°C for 3 min Total plate count plated on TSA (tryptic soy agar) Yeast and molds plated on Yeast and Mold Petrifilm	**Trial 1 (TPC and YM):** 1) 5.1, 3.9 2) 4.5, 3.1 3) 3.9, 1.9 **Trial 2 (TPC and YM):** 1) 5.0, 4.1 2) 5.0, 3.7 3) 4.3, 1.3 **Trial 3 (TPC and YM):** 1) 4.6, 4.9 2) 4.8, 4.3 3) 3.6, 1.3	CFU/cm^2		Fan et al., 2008
Cantaloupe, Rind tissue – Eastern (shipper)	*Salmonella enterica* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242), NA resistant	Whole melons immersed in inoculum suspension and constantly agitated with gloved hands for 5 min	Melon stored at 4°C or 30°C for 24 h and dipped into inoculum with initial temp. of 4°C or 30°C. Melons placed on elevated mesh screens for 2 min, then placed into a biosafety hood to dry for 1 h at 22°C.CFU	4 or 30	~7 log CFU/ml (Cocktail concentration)		**Melon Temp. and Inoculum Temp.:** 1) 4°C and 4°C 2) 4°C and 30°C 3) 30°C and 4°C 4) 30°C and 30°C	1) 5.00 2) 5.00 3) 4.56 4) 4.74 Adherence to or infiltration to rind is enhanced when cantaloupe is at 4°C compared with 30°C, regardless of immersion temperature.	CFU/cm^2	Inoculum (12 l at 4 or 30°C) was poured into PE bags and placed in a 34 l plastic container	Richards and Beuchat, 2004

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind tissue – Western (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242), NA resistant	Whole melons immersed in suspension and constantly agitated with gloved hands for 5 min	Melon stored at 4°C or 30°C for 24 h and dipped into inoculum with initial temp. of 4°C or 30°C. Melons placed on elevated mesh screens for 2 min, then placed into a biosafety hood to dry for 1 h at 22°C.	4 or 30	~7 log CFU/ml (Cocktail concentration)		**Melon Temp. and Inoculum Temp.:** 1) 4°C and 4°C 2) 4°C and 30°C 3) 30°C and 4°C 4) 30°C and 30°C	1) 5.25 2) 4.66 3) 5.32 4) 4.68 Melons at 30°C immersed in 30°C inoculum had significantly lower counts than melons at 4 or 30°C immersed in 4°C inoculum (indicates adherence of pathogen diminishes when warm fruits are immersed in warm inoculum)	CFU/cm^2	Inoculum (12 l at 4 or 30°C) was poured into PE bags and placed in a 34 l plastic container	Richards and Beuchat, 2004
Cantaloupe, Rind and mesocarp tissue – Western (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242), NA resistant	10 µl of *S.* Poona suspension (~5.9 log CFU/ml) pipetted directly in wounded rind tissue on Day 0	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of inoculation site – 4 inoculation sites/melon	20	3.90 log CFU/10 µl of inoculum	Day 3 (**D3**) Day 5 (**D5**) Day 7 (**D7**) Day 10 (**D10**)	**Distance from site of inoculation to inwards towards edible tissue:** 1) 0–1 cm 2) 1–2 cm 3) 2–3 cm 4) 3–4 cm	**D3**: 5.58, BD (0/8), BD (0/8), BD (0/8) **D5:** 6.28, 0.21 (1/7), BD (1/8), BD (0/8) **D7:** 6.75, 2.30 (0/2), 1.70 (2/4), 1.09 (2/5) **D10:** 5.36, BD (0/8), BD (0/8), BD (0/8) Results for each day are the distances of #'s 1–4 in treatment column BD – below limit of detection (1.30 log CFU/sample) Parentheses indicate # of melons positive for *S.* Poona after enrichment	CFU/tissue	Melons adjusted to 22°C over a 16- to 20-h period before experiments. Inoculated melons dried for 2 h at 22°C	Richards and Beuchat, 2005a

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind and mesocarp tissue – Western (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242), NA resistant; and *C. cladosporioides*	10 µl of *S.* Poona suspension (~5.9 log CFU/ml) and 10 µl of mold suspension (~4-5 log CFU/ml) pipetted directly in wounded rind tissue on Day 0	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of inoculation site – 4 inoculation sites/melon	20	3.90 log CFU/10 µl of inoculum	Day 3 (**D3**) Day 5 (**D5**) Day 7 (**D7**) Day 10 (**D10**)	**Distance from site of inoculation to inwards towards edible tissue:** 1) 0–1 cm 2) 1–2 cm 3) 2–3 cm 4) 3–4 cm	**D3**: 5.36, BD (1/8), BD (2/8), BD (2/8) **D5:** 5.74, BD (2/8), BD (1/8), BD (0/8) **D7:** 5.70, BD (5/8), BD (2/8), BD (2/8) **D10:** 5.98, BD (3/8), BD (1/8), BD (3/8) Results for each day are the distances of #'s 1–4 in the treatment specifications column BD – below limit of detection (1.30 log CFU/sample) Parentheses indicate # of melons positive for *S.* Poona after enrichment	CFU/tissue	Melons adjusted to 22°C over a 16- to 20-h period before experiments. Inoculated melons dried for 2 h at 22°.	Richards and Beuchat, 2005a
Cantaloupe, Rind and mesocarp tissue – Western (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242), NA resistant; and *P. expansum*	10 µl of *S.* Poona suspension (~5.9 log CFU/ml) and 10 µl of mold suspension (~4-5 log CFU/ml) pipetted directly in wounded rind tissue on Day 0	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of inoculation site – 4 inoculation sites/melon	20	3.90 log CFU/10 µl of inoculum	Day 3 (**D3**) Day 5 (**D5**) Day 7 (**D7**) Day 10 (**D10**)	**Distance from site of inoculation to inwards towards edible tissue:** 1) 0–1 cm 2) 1–2 cm 3) 2–3 cm 4) 3–4 cm	**D3:** 5.97, 0.47 (3/7), BD (0/8), BD (1/8) **D5:** 4.94, BD (3/8), BD (3/8), BD (2/8) **D7:** 2.61 (0/4), BD (0/8), BD (2/8), BD (0/8) **D10:** 2.71 (1/4), 0.75 (1/3), 0.52 (4/5), 0.24 (4/6) Results for each day are the distances of #'s 1–4 in the treatment specifications column BD – below limit of detection (1.30 log CFU/sample) Parentheses indicate # of melons positive for *S.* Poona after enrichment	CFU/tissue	Melons adjusted to 22°C over a 16- to 20-h period before experiments Inoculated melons dried for 2 h at 22°C	Richards and Beuchat, 2005a

Growth, Reduction, and Survival of Bacteria on Melon Types

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind and mesocarp tissue – Western (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242), NA resistant; and *C. cladosporioides*	10 µl of mold suspension (~4-5 log CFU/ml) pipetted on wounded rind tissue on Day 0, followed by inoculation of 10 µl of *S.* Poona suspension (~5.9 log CFU/ml) 3 days later	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of inoculation site – 4 inoculation sites/melon; analysis done respective days after inoculation with *S.* Poona	20	3.20 log CFU/10 µl of inoculum	Day 3 (**D3**) Day 5 (**D5**) Day 7 (**D7**) Day 10 (**D10**)	**Distance from site of inoculation to inwards towards edible tissue:** 1) 0–1 cm 2) 1–2 cm 3) 2–3 cm 4) 3–4 cm	**D3:** 3.77 (1/1), BD (0/8), BD (5/8), BD (4/8) **D5:** 6.33, 1.16 (0/6), BD (2/8), BD (1/8) **D7:** 5.11 (0/1), 0.96 (2/6), BD (3/8), BD (4/8) **D10:** 4.74 (1/1), BD (2/8), BD (2/8), BD (1/8) Results for each day are the distances of #'s 1–4 in the treatment specifications column BD – below limit of detection (1.30 log CFU/sample) Parentheses indicate # of melons positive for *S.* Poona after enrichment	CFU/tissue	Melons adjusted to 22°C over a 16- to 20-h period before experiments Inoculated melons dried for 2 h at 22°C	Richards and Beuchat, 2005a
Cantaloupe, Rind and mesocarp tissue – Western (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242), NA resistant; and *P. expansum*	10 µl of mold suspension (~4-5 log CFU/ml) pipetted on wounded rind tissue on Day 0, followed by inoculation of 10 µl of *S.* Poona suspension (~5.9 log CFU/ml) 3 days later	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of inoculation site – 4 inoculation sites/melon; analysis done respective days after inoculation with *S.* Poona	20	3.20 log CFU/10 µl of inoculum	Day 3 (**D3**) Day 5 (**D5**) Day 7 (**D7**) Day 10 (**D10**)	**Distance from site of inoculation to inwards towards edible tissue:** 1) 0–1 cm 2) 1–2 cm 3) 2–3 cm 4) 3–4 cm	**D3:** 0.66 (0/6), BD (0/8), BD (0/8), BD (0/8) **D5:** 0.60 (0/6), BD (0/8), BD (0/8), BD (0/8) **D7:** 0.30 (1/7), BD (1/8), BD (0/8), BD (0/8) **D10:** 1.11 (0/5), BD (0/8), BD (0/8), BD (0/8) Results for each day are the distances of #'s 1–4 in the treatment specifications column BD – below limit of detection (1.30 log CFU/sample) Parentheses indicate # of melons positive for *S.* Poona after enrichment	CFU/tissue	Melons adjusted to 22°C over a 16- to 20-h period before experiments Inoculated melons dried for 2 h at 22°C	Richards and Beuchat, 2005a

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Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind – 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.64 log CFU/20 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 2.13 (1/1) 2) 9.03 (ND) 3) 2.01 (1/1) 4) 9.38 (ND) 5) 1.04 (2/2) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.64 log CFU/20 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (0/3) 2) 1.46 (2/2) 3) < 1.60 (2/3) 4) 6.53 (ND) 5) < 1.60 (2/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *A. alternata*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.34 log CFU/10 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (1/3) 2) 1.38 (0/2) 3) < 1.60 (1/3) 4) 5.89 (ND) 5) < 1.60 (0/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *A. alternata*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.64 log CFU/10 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 3.45 (ND) 2) 8.66 (ND) 3) 3.24 (ND) 4) 9.21 (ND) 5) 1.84 (1/1) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *A. alternata*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 1.42 (0/2) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *A. alternata*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 7.75 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *A. alternata*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 0.69 (1/0) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *A. alternata*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 8.27 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.64 log CFU/20 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (0/3) 2) 1.46 (2/2) 3) < 1.60 (2/3) 4) 6.53 (ND 5) < 1.60 (2/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation.	Richards and Beuchat, 2005b

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Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *C. cladosporioides*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.64 log CFU/20 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 2.13 (1/1) 2) 9.03 (ND) 3) 2.01 (1/1) 4) 9.38 (ND) 5) 1.04 (2/2) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *C. cladosporioides*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.34 log CFU/10 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (0/3) 2) 1.25 (2/2) 3) < 1.60 (0/3) 4) 6.23 (ND) 5) < 1.60 (1/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation.	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *C. cladosporioides*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.34 log CFU/10 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 4.13 (ND) 2) 8.57 (ND) 3) 3.69 (ND) 4) 9.32 (ND) 5) 2.05 (ND) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *C. cladosporioides*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 1.61 (1/1) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *C. cladosporioides*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 8.92 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *C. cladosporioides*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 1.83 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

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Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *C. cladosporioides*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 9.53 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.11 log CFU/20 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (1/3) 2) 1.25 (0/2) 3) < 1.60 (2/3) 4) 7.78 (ND) 5) < 1.60 (2/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *E. nigrum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.11 log CFU/20 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 2.44 (ND) 2) 7.88 (ND) 3) 1.76 (1/1) 4) 9.41 (ND) 5) < 1.60 (3/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *E. nigrum*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	2.81 log CFU/10 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (1/3) 2) < 1.60 (3/3) 3) < 1.60 (1/3) 4) < 1.60 (2/3) 5) < 1.60 (0/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *E. nigrum*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	2.81 log CFU/10 µl of inoculum for both incubation temp.	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 3.41 (ND) 2) 4.72 (0/1) 3) < 1.60 (3/3) 4) 9.44 (ND) 5) < 1.60 (2/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *E. nigrum*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.42 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) < 1.60 (3/3) 2) 5.20 (0/1) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *E. nigrum*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon.	20	3.42 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 7.80 (ND) 2) 9.20 (ND) 3) ND (ND) ND – Enrichment steps Initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *E. nigrum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.11 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 0.88 (2/2) 2) 2.84 (0/1) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *E. nigrum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.11 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 8.87 (ND) 2) 9.48 (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.51 and 3.64 log CFU/20 µl of inoculum for 4 and 20°C, respectively	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (0/3) 2) 1.46 (2/2) 3) < 1.60 (2/3) 4) 6.53 (ND) 5) < 1.60 (0/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *G. candidum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.51 and 3.64 log CFU/20 µl of inoculum for 4 and 20°C, respectively	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 2.13 (1/1) 2) 9.03 (ND) 3) 2.01 (1/1) 4) 9.38 (ND) 5) 1.04 (2/2) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *G. candidum*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.21 and 3.34 log CFU/10 µl of inoculum for 4 and 20°C, respectively	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (3/3) 2) 0.76 (1/2) 3) < 1.60 (1/3) 4) 5.72 (ND) 5) < 1.60 (1/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation.	Richards and Beuchat, 2005b

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *G. candidum*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.21 and 3.34 log CFU/10 µl of inoculum for 4 and 20°C, respectively	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 4.89 (ND) 2) 7.84 (0/1) 3) 4.91 (ND) 4) 8.91 (ND) 5) 4.74 (ND) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation.	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *G. candidum*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 2.80 (1/1) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *G. candidum*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 8.18 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *G. candidum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 3.70 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *G. candidum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 8.58 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.64 log CFU/20 µl of inoculum for both temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (0/3) 2) 1.46 (2/2) 3) < 1.60 (2/3) 4) 6.53 (ND) 5) < 1.60 (2/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *P. expansum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto rind - 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.64 log CFU/20 µl of inoculum for both temp.	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) 2.13 (1/1) 2) 9.03 (ND) 3) 2.01 (1/1) 4) 9.38 (ND) 5) 1.04 (2/2) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *P. expansum*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.34 log CFU/10 µl of inoculum for both temp.	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (2/3) 2) < 1.60 (1/3) 3) < 1.60 (1/3) 4) 6.29 (ND) 5) < 1.60 (0/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation.	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *P. expansum*	10 µl of conidia suspension (4 log CFU/ml) and 10 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	4 or 20	3.34 log CFU/10 µl of inoculum for both temp	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (4°C) 2) Day 7 (20°C) 3) Day 14 (4°C) 4) Day 14 (20°C) 5) Day 21 (4°C) 6) Day 21 (20°C)	1) < 1.60 (2/3) 2) 8.87 (ND) 3) < 1.60 (2/3) 4) 7.47 (ND) 5) < 1.60 (0/3) 6) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

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Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *P. expansum*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 4.88 (1/1) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *P. expansum*	20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 0, then 20 µl of *S.* Poona suspension inoculated on Day 3 (5 log CFU of each strain/ml) Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon	20	3.48 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 6.74 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *P. expansum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for intact sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) < 1.60 (2/3) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant; and *P. expansum*	20 µl of *S.* Poona suspension (5 log CFU of each strain/ml) inoculated on Day 0, then 20 µl of conidia suspension (4 log CFU/ml) inoculated on Day 3 Inoculated onto 6 sites (3 intact, 3 wounded)	End (8-mm wide) of stainless steel spatula used to create a 4-mm deep wound in center of 3 inoculation sites – 6 inoculation sites/melon Analysis done on respective days 2 d after inoculation with *S.* Poona	20	3.64 log CFU/20 µl of inoculum	7, 14, 21 days	**Final counts for wounded sites on rind:** 1) Day 7 (20°C) 2) Day 14 (20°C) 3) Day 21 (20°C)	1) 8.72 (ND) 2) ND (ND) 3) ND (ND) ND – Enrichment steps initiated but not completed because counts obtained by direct plating or samples too decayed to analyze. Parentheses indicate # of samples + for *S.* Poona out of number enriched	CFU/rind	Inoculated melons dried under laminar flow hood for 2h at 22°C before placing in PE containers and incubation	Richards and Beuchat, 2005b
Cantaloupe, Rind	*Salmonella* Typhimurium LT2 (NA resistant)	20 µl of inoculum (10^8 CFU/ml) was spot inoculated onto a 2.5 cm^2 section of the rind of intact whole melon	After 1h dry, whole melons were soaked or scrubbed for 60s in water Rind squares were excised for recovery of bacteria	n/a	1) 5.2 2) <1.7 Counts for inoculated site (1) and adjacent site (2)	n/a	Sites adjacent to or on side opposite (remote site) of inoculated site were also examined for spread of bacteria throughout washing Scrub brush also examined for bacterial residue counts	**Soak 60s:** 1) 4.5 (inoculated site) 2) <1.7 (adjacent site) 3) <1.7 (remote site) **Scrubbed 60s:** 1) 3.6 (inoculated site) 2) <1.7 (adjacent site) 3) <1.7 (remote site) 4) ND (scrub brush) LOD (<5 CFU/sample)	CFU/sample		Parnell et al., 2004
Cantaloupe, Rind	*Salmonella* Typhimurium LT2 (NA resistant)	20 µl of inoculum (10^8 CFU/ml) was spot inoculated onto a 2.5 cm^2 section of the rind of intact whole melon	After 1h dry, whole melons were soaked or scrubbed for 60s in 200 ppm total chlorine Rind squares were excised for recovery of bacteria	n/a	1) 5.3 2) <1.7 Counts for inoculated site (1) and adjacent site (2)	n/a	Sites adjacent to or on side opposite (remote site) of inoculated site were also examined for spread of bacteria throughout washing. Scrub brush also examined for bacterial residue counts	**Soak 60s:** 1) 3.5 (inoculated site) 2) <1.7 (adjacent site) 3) <1.7 (remote site) **Scrubbed 60s:** 1) 2.6 (inoculated site) 2) <1.7 (adjacent site) 3) <1.7 (remote site) 4) <2.4 (scrub brush) LOD (<5 CFU/sample)	CFU/sample		Parnell et al., 2004

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Cantaloupe, Rind	*Salmonella* Typhimurium LT2 (NA resistant)	20 µl of inoculum (10^8 CFU/ml) was spot inoculated onto a 2.5 cm^2 section of the rind of intact whole melon	After 1h dry, whole melons were soaked or scrubbed in water Rind squares were excised for recovery of bacteria	n/a	1) 5.5 2) <1.7 Counts for inoculated site (1) and adjacent site (2)		Sites adjacent to or on side opposite (remote site) of inoculated site were also examined for spread of bacteria throughout washing. Scrub brush also examined for bacterial residue counts	**Scrubbed 5s and 10s:** 1) 3.8, 3.9 (inoculated site) 2) 2.2, <1.7 (adjacent site) 3) <1.7, <1.7 (remote site) 4) 3.4, 3.7 (scrub brush) **Immersed 30 s:** 1) 5.1 (inoculated site) 2) <1.7 (adjacent site) 3) 3) <1.7 (remote site)	CFU/sample	LOD (<5 CFU/sample)	Parnell et al., 2004
Cantaloupe, Stem scar tissue – Eastern (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	Whole melons immersed in suspension and constantly agitated with gloved hands for 5 min	Melon stored at 4°C or 30°C for 24 h and dipped into inoculum with initial temp. of 4°C or 30°C Melons placed on elevated mesh screens for 2 min, then placed into a biosafety hood to dry for 1 h at 22°C	4 or 30	~7 log CFU/ml (Cocktail concentration)		**Melon Temp. and Inoculum Temp.:** 1) 4°C and 4°C 2) 4°C and 30°C 3) 30°C and 4°C 4) 30°C and 30°C	1) 5.83 2) 6.01 3) 6.00 4) 5.79 Populations recovered were not significantly different, regardless of cantaloupe and inoculum temperature combination	CFU/cm^2	Inoculum (12 l at 4 or 30°C) was poured into PE bags and placed in a 34 l plastic container	Richards and Beuchat, 2004
Cantaloupe, Stem scar tissue – Western (shipper)	*Salmonella* Poona (00A3207, 01A3923, 02A3275, 00A3279, 01A242) NA resistant	Whole melons immersed in suspension and constantly agitated with gloved hands for 5 min	Melon stored at 4°C or 30°C for 24 h and dipped into inoculum with initial temp. of 4°C or 30°C Melons placed on elevated mesh screens for 2 min, then placed into a biosafety hood to dry for 1 h at 22°C	4 or 30	~7 log CFU/ml (Cocktail concentration)		**Melon Temp. and Inoculum Temp.:** 1) 4°C and 4°C 2) 4°C and 30°C 3) 30°C and 4°C 4) 30°C and 30°C	1) 5.56 2) 5.42 3) 6.78 4) 5.37 Populations recovered were not significantly different, regardless of cantaloupe and inoculum temperature combination	CFU/cm^2	Inoculum (12 l at 4 or 30°C) was poured into PE bags and placed in a 34 l plastic container	Richards and Beuchat, 2004

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Honeydew, Whole	*E. coli* NCTC 10418	Submerged in inoculum (2 concentrations: 10^4 and 10^6) solution for 5 min, dried for 1 h at 20 ± 2°C	Stored for 1 d at 12°C, then 5 days at 8°C (stored to simulate commercial distribution in Australia); placed in an open bag to allow for high RH	12 and 8	3.12	6 d	n/a	Detected on 1 out of 4 samples after enrichment Results shown for the high inoculum concentration	CFU/cm^2		Behrsing et al., 2003
Honeydew, Whole	*E. coli* O157:H7 (SEA 13B88 and Oklahoma)	Submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min	Dried in biosafety cabinet for 1 h, then stored at 5°C for up to 7 days before treatments	5	3.45	0 or 7 days	**Wash Treatments:** 1) sterile tap water 2) 2.5% H_2O_2 3) solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	**Results shown for Day 0:** 1) No significant reduction (data not shown) 2) 3 log reduction 3) none detected Treatment with HPLNC after Day 7 was more significant at reducing bacterial population than H_20_2 Population of *E. coli* slightly decreased during storage for 7 days	CFU/cm^2	pH of both wash solutions adjusted to 6.7 by adding 2N NaOH, melons were washed similar to method of inoculation, however, only rotated for 5 min	Ukuku et al., 2005
Honeydew, Whole	*Listeria innocua* 2305	Submerged in inoculum (2 concentrations: 10^3 and 10^5) solution for 5 min, dried for 1 h at 20 ± 2°C	Stored for 1 d at 12°C, then 5 days at 8°C (simulating commercial distribution in Australia); placed in an open bag to allow for high RH	12 and 8	2.28	6 days	n/a	0.97 Results shown for the high inoculum concentration	CFU/cm^2		Behrsing et al., 2003

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Honeydew, Whole	*Listeria monocytogenes* (Scott A and CCR1-L-G)	Submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min	Dried in biosafety cabinet for 1 h, then stored at 5°C for up to 7 days before treatments	5	3.05	0 or 7 days	**Wash Treatments:** 1) Sterile tap water 2) 2.5% H_2O_2 3) Solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	**Results shown for Day 0:** 1) No significant reduction (data not shown) 2) 3 log reduction 3) none detected Treatment with HPLNC after Day 7 was more significant at reducing bacterial population than H_20_2 Population of *L. mono* remained the same during storage for 7 days	CFU/cm^2	pH of both wash solutions adjusted to 6.7 by adding 2N NaOH, melons were washed similar to method of inoculation, however, only rotated for 5 min	Ukuku et al., 2005
Honeydew, Whole	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	n/a	n/a	n/a	n/a	n/a	n/a	2.8, 0.8, 0.3 Results for mesophiles, YM, and *Pseudomonas* spp., respectively	CFU/cm^2		Ukuku and Sapers, 2007
Honeydew, Whole	*Salmonella* Salford IMB 1710	Submerged in inoculum (2 concentrations: 10^3 and 10^6) solution for 5 min, dried for 1 h at 20 ± 2°C	Stored for 1 d at 12°C, then 5 days at 8°C (stored to simulate commercial distribution in Australia); placed in an open bag to allow for high RH	12 and 8	1.92	6 days	n/a	Detected on 4 out of 4 samples after enrichment Results shown for the high inoculum concentration	CFU/cm^2		Behrsing et al., 2003
Honeydew, Fresh-cut	*E. coli* O157:H7 (SEA 13B88 and Oklahoma)	Whole melon was submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min (Transference of pathogen by cutting)	Inoculated whole melons cut into 4 sections, rinds removed, and interior flesh cut into ~3 cm cubes	5		0 or 7 days	**Wash Treatments:** 1) Sterile tap water 2) 2.5% H_2O_2 3) Solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	1) 6, 6 2) 0 (0), 2 (2) 3) 0 (0), 0 (0) Final counts are # of melons (rinds) out of 6 that were positive for pathogen at Days 0 and 7, respectively See comments for number in parentheses		#'s in parentheses represent fresh-cut pieces that were negative by direct plating but positive after enrichment	Ukuku et al., 2005

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Honeydew, Fresh-cut	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	n/a	n/a	n/a	n/a	n/a	n/a	0.9, BD, BD Results for mesophiles, YM, and *Pseudomonas* spp., respectively	CFU/g	BD = below limit of detection (1 CFU/g)	Ukuku and Sapers, 2007
Honeydew, Fresh-cut	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	Transference of pathogen during cutting	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; pieces were then left out at 22°C for 5 h, then refrigerated at 5°C for 3 h	n/a	n/a	n/a	n/a	Mesophiles increased ~1 log Yeast and mold BD (<1 CFU/g) for up to 2 h *Pseudomonas* spp. increased ~1 log	CFU/g		Ukuku and Sapers, 2007
Honeydew, Fresh-cut	*Listeria monocytogenes* strain LCDC 81-861	Pipette inoculated w/ 25 µl of pathogen suspension (placed in commercial 530-ml dome fruit plastic bowls before inoculated)	Inoculated pieces sprayed with 25 µl of various concentrations (10^4, 10^5, 10^6, 10^7, 10^8) of phage mixture (2 pieces /treatment placed in each bowl)	10	1) 1.5 2) 1.3 3) 1.2 4) 0.7 5) 1.1 6) 0.0	0 d 2 d 5 d 7 d	**Phage Concentration:** 1) 0 2) 10^4 3) 10^5 4) 10^6 5) 10^7 6) 10^8	1) 2.7, 5.3, 6.1 2) 2.7, 5.2, 6.1 3) 2.6, 5.0, 6.3 4) 2.2, 4.4, 5.3 5) 1.1, 3.1, 4.0 6) 0.0, 0.4, 1.8 Results shown for Days 2, 5, and 7, respectively	CFU/sample	Phage concentration in units of PFU/mL	Leverentz et al., 2004
Honeydew, Fresh-cut	*Listeria monocytogenes* strain LCDC 81-861	Pipette inoculated w/ 25 µl of pathogen suspension (placed in commercial 530-ml dome fruit plastic bowls before inoculated)	25 µl of phage cocktail pipetted onto a depression on the fruit pieces at each specified time	10	1 h: 0.9 0.5 h: 0	0 d 2 d 5 d 7 d	These pieces treated 1 h and 0.5 h BEFORE inoculated	Day 2: (0.3, 0) Day 5: (0.8, 0.8) Day 7: (2.3, 0.4) Results shown for 1h and 0.5 h each day	CFU/sample	Phage concentration in units of PFU/mL	Leverentz et al., 2004

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Honeydew, Fresh-cut	*Listeria monocytogenes* strain LCDC 81-861	Pipette inoculated w/ 25 µl of pathogen suspension (placed in commercial 530-ml dome fruit plastic bowls before inoculated)	25 µl of phage cocktail pipetted onto a depression on the fruit pieces at each specified time	10	1) 0.8 2) 1.4 3) 1.0 4) 1.6 5) 1.6	0 d 2 d 5 d 7 d	**Pieces sprayed:** 1) 0 h after contam. 2) 0.5 h after contam. 3) 1 h after contam. 4) 2 h after contam. 5) 4 h after contam.	1) 0, 2.9, 5.7, 7.2 2) 0, 0, 3.2, 4.6 3) 1.3, 0.3, 2.7, 3.1 4) 1.3, 0.7, 3.7, 4.1 5) 0.3, 1.7, 4.0, 5.6 Results shown for specified treatment at Day 0, 2, 5, and 7, respectively	CFU/sample	Phage concentrations in units of PFU/mL	Leverentz et al., 2004
Honeydew, Fresh-cut	*Listeria monocytogenes* (Scott A and CCR1-L-G)	Whole melon was submerged in 3 l of inoculum, rotated with a glove-covered hand for 10 min (Transference of pathogen by cutting)	Inoculated whole melons cut into 4 sections, rinds removed, and interior flesh cut into ~3 cm cubes	5		0 or 7 days	**3 Wash Solutions:** 1) Sterile tap water 2) 2.5% H_2O_2 3) Solution of 1% H_2O_2, 25 µg/ml nisin, 1% sodium lactate (NaL), and 0.5% citric acid (HPLNC)	1) 6, 6 2) 0 (0), 0 (0) 3) 0 (0), 0 (0) Final Counts are # out of 6 melons (rinds) that were positive for pathogen at Day 0 and Day 7, respectively See comments for #'s in parentheses		#'s in parentheses represent fresh-cut pieces that were negative by direct plating, but positive after enrichment	Ukuku et al., 2005
Honeydew, Fresh-cut	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5 CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed inside a 9.75-inch diameter, 3-pocket, plastic bowl	5, 10, and 22	1.9	Up to 12 days		**5°C:** Decreased by 1 log over 10 days **10°C:** Increased to 3.0 log by Day 12 **22°C:** Increased to 6.0 log by Day 12	CFU/g	Whole melons were individually washed under running tap water (19°C) for 5 min to mimic home preparation before cut.	Ukuku and Sapers, 2007

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Honeydew, Fresh-cut	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5 CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed in a 9.75-inch diameter, 3-pocket, plastic bowl	5 and/ or 22			1) Stored at 5°C immediately after preparation 2) Held at 22°C for 3 h before storage at 5°C 3) Held at 22°C for 5 h before storage at 5°C 4) Held at 5°C for 3 h after preparation	1) 1.9 2) 2.0 3) 2.6 4) 1.5	CFU/g		Ukuku and Sapers, 2007
Honeydew, Rind	*Salmonella* Typhimurium LT2 (NA resistant)	20 µl of inoculum (10^8 CFU/ml) was spot inoculated onto a 2.5 cm^2 section of the rind of intact whole melon	After 1h, dry, whole melons were soaked or scrubbed for 60s in water Rind squares were excised for recovery of bacteria	n/a	1) 5.8 2) ND Counts for inoculated site (1) and adjacent site (2). ND – not done	n/a	Sites adjacent to or on side opposite (remote site) of inoculated site were also examined for spread of bacteria throughout washing; Scrub brush also examined for bacterial residue counts; Recovered using BSAN (bismuth sulfite agar supplemented with 50 µg/ml nalidixic acid	**Soak 60s:** 1) 3.0 (inoculated site) 2) <1.7 (adjacent site) 3) <1.7 (remote site) **Scrubbed 60s:** 1) <1.7 (inoculated site) 2) <1.7 (adjacent site) 3) <1.7 (remote site) 4) <2.6 (scrub brush) LOD (<5 CFU/sample)	CFU/sample		Parnell et al., 2004
Watermelon, Whole	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	n/a	n/a	n/a	n/a	n/a	n/a	4.1, 0.8, 0.4 Results for mesophiles, YM, and *Pseudomonas* spp., respectively	CFU/cm^2		Ukuku and Sapers, 2007

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Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Watermelon, Fresh-cut	*E. coli* O157:H7 (204P, 301C, 505B, 45753-35)	Pieces placed in stomacher bags and inoculated 1.0 ml of 10^4 cocktail (method not specified)	Rinds sanitized before cutting, flesh cut into 2-cm cubes	5 or 25	Not specified	Up to 34 h	Cubes held at 5°C or 25°C for up to 34 h	Watermelon cubes incubated at 25°C supported growth better than cantaloupe Significant ($p<0.05$) increases in population occurred b/t 4 and 6 h Population reached 8.51 log after 28 h incubation at 25°C No significant change in population on cubes held at 5°C	CFU/g of melon	Watermelon (pH 5.56), cantaloupe (pH 7.01) Article has hand-drawn graph of growth at various time intervals up to 34 h	Delrosario and Beuchat, 1995
Watermelon, Fresh-cut	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	n/a	n/a	n/a	n/a	n/a	n/a	0.8, BD, BD Results for mesophiles, YM, and *Pseudomonas* spp., respectively	CFU/g	BD = below limit of detection (1 CFU/g)	Ukuku and Sapers, 2007
Watermelon, Fresh-cut	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	Transference of pathogen during cutting	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; pieces were then left out at 22°C for 5 h, then refrigerated at 5°C for 3 h	n/a	n/a	n/a	n/a	Mesophiles increased ~1 log Yeast and mold BD (<1 CFU/g) for up to 2 h *Pseudomonas* spp. increased ~1 log	CFU/g		Ukuku and Sapers, 2007
Watermelon, Fresh-cut	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5 CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed inside a 9.75-inch diameter, 3-pocket, plastic bowl	5, 10, and 22	2.0	Up to 12 days		**5°C:** Decreased by 1 log over 10 days **10°C:** Increased to 3.0 log by Day 12 **22°C:** Increased to 3.8 log by Day 12	CFU/g	Whole melons were individually washed under running tap water (19°C) for 5 min to mimic home preparation before cut.	Ukuku and Sapers, 2007

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Watermelon, Fresh-cut	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5 CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed inside a 9.75-inch diameter, 3-pocket, plastic bowl	5 and/ or 22			1) Stored at 5°C immediately after preparation 2) Held at 22°C for 3 h before storage at 5°C 3) Held at 22°C for 5 h before storage at 5°C 4) Held at 5°C for 3 h, after preparation	1) 2.1 2) 2.0 3) 2.2 4) 1.6	CFU/g		Ukuku and Sapers, 2007
Watermelon, Rind	*E. coli* O157:H7 (204P, 301C, 505B, 45753-35)	7 areas (2–3 cm in diameter) delineated on rind	0.2 ml of inoculum (10^2 log CFU/ml) pipetted in each of the 7 areas on rind, melons held in covered plastic boxes until enumeration; RH 93 ± 5%	5 or 25	Not specified	up to 21 days		**25°C:** Significant ($p<0.05$) increases in population w/in 4 days, then remained constant thereafter Growth more prolific on cantaloupe than watermelon rind **5°C:** Significant decreases w/in 4 days, $<10^1$ recovered after 14 days	CFU/cm^2 of rind surface	Inoculated areas remained wet throughout incubation due to high RH.	Delrosario and Beuchat, 1995
Mixed Melons, Fresh-cut (cantaloupe, honeydew, watermelon)	Natural microflora (aerobic mesophilic bacteria, YM, *Pseudomonas* spp.)	Transference of pathogen during cutting	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; pieces were then left out at 22°C for 5 h, then refrigerated at 5°C for 3 h	n/a	n/a	n/a	n/a	Mesophiles increased ~1 log Yeast and mold increased from 0.9 to 1.7 log *Pseudomonas* spp. increased ~1 log	CFU/g		Ukuku and Sapers, 2007

Fruit, Type	Pathogen	Method of Inoculation	Treatment / Storage Conditions	Temp (°C)	Initial Counts (log CFU)	Incubation time	Treatment Specifications	Final Counts (log_{10} CFU)	Unit	Comments	Reference
Mixed Melons, Fresh-cut (cantaloupe, honeydew, watermelon)	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5 CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed inside a 9.75-inch diameter, 3-pocket, plastic bowl	5, 10, and 22	2.2	Up to 12 days		**5°C:** No significant decline after 12 d **10°C:** Data not specified **22°C:** Plateaued at Day 2 and declined to below initial populations thereafter	CFU/g	Whole melons were individually washed under running tap water (19°C) for 5 min to mimic home preparation before cut.	Ukuku and Sapers, 2007
Mixed Melons, Fresh-cut (cantaloupe, honeydew, watermelon)	*Salmonella* (Newport 02-216, Poona 418, Hidalgo 02-517-2, Typhimurium 45, St. Paul FSIS 039)	Pieces submerged in inoculum (10^5 CFU/ml) for 30 s	Whole melon cut into 4 sections, rinds removed, flesh cut into 3-cm cubes; after inoculation, pieces dried for 1 h, then placed inside a 9.75-inch diameter, 3-pocket, plastic bowl	5 and/ or 22			1) Stored at 5°C immediately after preparation 2) Held at 22°C for 3 h before storage at 5°C 3) Held at 22°C for 5 h before storage at 5°C 4) Held at 5°C for 3 h, after preparation	1) 2.5 2) 2.8 3) 3.6 4) 2.0	CFU/g		Ukuku and Sapers, 2007

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