

# Bacteria Test Results

**STUDY RUN BY:** MICROBIOTEST, INC.

**STUDY TITLE:** Fruit and Vegetable Antibacterial Wash Test

**STUDY SPONSOR:** Tersano (International) SRL

**TEST AGENT NAME:** lotus Sanitizing System

**ACTIVE INGREDIENT:** Ozone

**CHALLENGE BACTERIA:** *Escherichia coli*, ATCC 11229  
*Listeria monocytogenes*, ATCC 19111  
*Salmonella choleraesuis*, ATCC 10708

**EXPOSURE TIME:** 30 seconds and 2 minutes (For each fruit and vegetable type, per exposure time, three inoculated, dried carriers were added and the bowl adapter containing 2 L of sterile tap water.)

The system was activated and ozone was generated. The generation time for each batch of test material ranged from 3 minutes and 20 seconds to 5 minutes. The automated system prompted the user when ozone generation was complete. For each evaluation, the exposure time was initiated at the completion of each ozone generation.

**RESULTS:** All plates were examined for purity. The challenge microorganisms were confirmed by Gram stain and colony morphology to be consistent with *E. coli*, *L. monocytogenes* and *S. choleraesuis*. The sterility controls exhibited no growth. There were no bioburden counts recovered from any of the fruit and vegetables evaluated. Percent reduction and log<sub>10</sub> reduction were calculated using the following equations:

$$\frac{\text{Initial count (CFU/Carrier)} - \text{Test result (CFU/Carrier)}}{\text{Initial count (CFU/Carrier)}} \times 100 = \text{Percent Reduction}$$

$$\text{Log}_{10} \text{ Initial Count (CFU/Carrier)} - \text{Log}_{10} \text{ Test Results (CFU/Carrier)} = \text{Log}_{10} \text{ Reduction}$$

## Test Results (30 second contact time)

Microorganism	Carrier Type	CFU/Carrier	Log <sub>10</sub> Reduction	Percent Reduction
<i>E. coli</i>	Tomato	1.00E+01	4.98	99.9989
		1.00E+01	4.98	99.9989
		1.00E+01	4.98	99.9989
	Grape	1.30E+03	2.14	99.2778
		9.60E+02	2.27	99.4667
		1.90E+03	1.98	98.9444
	Snow Pea Pod	2.40E+03	3.00	99.8400
		1.20E+03	3.10	99.9200
		5.40E+03	2.44	99.6400
	Kumquat	2.30E+02	2.87	99.8647
		1.00E+01	4.23	99.9941
		1.00E+01	4.23	99.9941
<i>L. monocytogenes</i>	Tomato	1.00E+01	5.28	99.9995
		1.00E+01	5.28	99.9995
		1.00E+01	5.28	99.9995
	Grape	4.30E+04	2.02	99.0444
		2.80E+04	2.21	99.3778
		7.20E+04	1.80	98.4000
	Snow Pea Pod	1.30E+04	2.45	99.6486
		2.60E+03	3.15	99.9297
		2.10E+04	2.25	99.4324
	Kumquat	3.70E+04	1.61	97.5333
		2.30E+05	0.81	84.6667
		1.80E+05	0.92	88.0000
<i>S. choleraesuis</i>	Tomato	1.00E+01	3.43	99.9630
		1.00E+01	3.43	99.9630
		1.00E+01	3.43	99.9630
	Grape	1.00E+01	4.04	99.9909
		1.00E+01	4.04	99.9909
		1.00E+01	4.04	99.9909
	Snow Pea Pod	1.70E+03	2.31	99.5143
		1.80E+02	3.29	99.9486
		4.60E+02	2.88	99.8686
	Kumquat	1.80E+02	2.14	99.2800
		1.00E+01	3.40	99.9600
		1.00E+01	3.40	99.9600

## Test Results (2 minute contact time)

Microorganism	Carrier Type	CFU/Carrier	Log <sub>10</sub> Reduction	Percent Reduction
<i>E. coli</i>	Tomato	1.00E+01	4.98	99.9989
		1.00E+01	4.98	99.9989
		1.00E+01	4.98	99.9989
	Grape	2.70E+02	2.82	99.8500
		5.00E+01	3.56	99.9722
		3.90E+02	2.66	99.7833
	Snow Pea Pod	8.40E+02	3.00	99.9440
		1.10E+03	3.13	99.9267
		2.00E+03	2.88	99.8667
	Kumquat	1.00E+01	4.23	99.9941
		1.00E+01	4.23	99.9941
		1.00E+01	4.23	99.9941
<i>L. monocytogenes</i>	Tomato	1.00E+01	5.28	99.9995
		1.00E+01	5.28	99.9995
		1.00E+01	5.28	99.9995
	Grape	2.20E+03	3.31	99.9511
		7.20E+03	2.80	99.8400
		4.00E+03	3.05	99.9111
	Snow Pea Pod	2.50E+04	2.17	99.3243
		2.70E+03	3.14	99.9270
		1.60E+03	3.36	99.9568
	Kumquat	1.10E+03	3.13	99.9267
		5.40E+03	2.44	99.6400
		9.20E+02	3.21	99.9387
<i>S. choleraesuis</i>	Tomato	1.00E+01	3.43	99.9630
		1.00E+01	3.43	99.9630
		1.00E+01	3.43	99.9630
	Grape	1.00E+01	4.04	99.9909
		1.00E+01	4.04	99.9909
		1.00E+01	4.04	99.9909
	Snow Pea Pod	1.20E+03	2.46	99.6571
		1.30E+03	2.43	99.6286
		1.40E+02	3.40	99.9600
	Kumquat	1.00E+01	3.40	99.9600
		1.00E+01	3.40	99.9600
		1.00E+01	3.40	99.9600