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## **AGRICULTURAL RESEARCH SERVICE STUDY**

Evaluation of Safe<sub>2</sub>O™<sub>-brand</sub> Poultry Wash  
Antimicrobial Efficacy for the Reduction of Selected  
Microorganisms on Fresh Chicken Carcasses as Evaluated  
by the Agricultural Research Service

### **OBJECTIVE**

Evaluate the antimicrobial efficacy of Safe<sub>2</sub>O™<sub>-brand</sub> Poultry Wash in the reduction of aerobic, *Campylobacter jejuni*, *E. coli* and *Salmonella spp.* bacteria on fresh chicken carcasses.

## Protocol for Safe<sub>2</sub>O<sup>TM</sup>-brand Poultry Wash

1. Pick up 24 carcasses from processing plant before final wash
2. Inoculate all carcasses with Naladixic acid resistant Salmonella (approximately Log<sub>10</sub> 3)
3. Treatment groups:

<u>Group</u>	<u>Treatment</u>	<u>Sample Bird Quantity</u>
Group 1	Plant run controls	6
Group 2	Water Spray	6
Group 3	Safe <sub>2</sub> O <sup>TM</sup> -brand Poultry Wash Spray	6
Group 4	Sodium Phosphate tri basic	6

4. After 5-10 minutes do whole carcass rinse on the plant run controls (no chill after rinse)  
Baseline information only.
5. Spray Groups 2,3 and 4 with outside wash only for 5 seconds {.35 gal/carcass}.
6. Wait 5 minutes.
7. Spray Groups 2,3 and 4 with inside/outside wash for five seconds {.4 gal/carcass}.
8. Wait 2 minutes and place in chill tank for 70 minutes. Observe visual differences, if any and record as appropriate including digital pictures.
9. Remove all carcasses from the chill tank and rinse them.
10. Run micro for *Salmonella spp.*, *E. coli* and *Campylobacter jejuni*
11. Replicate three or four times as necessary.

**TABLE 1: Aerobe Count on Fresh Chicken Carcasses Post-Application**

Aerobes		Safe <sub>2</sub> O™-Poultry			
Sample	Plant Run log <sub>10</sub> /ml	Water log <sub>10</sub> /ml	Wash (log <sub>10</sub> /ml)	TSP log <sub>10</sub> /ml	
Rep 1	Bird 1	3.53	3.17	2.41	2.26
	Bird 2	3.72	3.63	2.91	1.48
	Bird 3	3.41	3.22	2.18	3.54
	Bird 4	4.90	2.80	1.85	3.48
	Bird 5	3.40	3.05	1.78	1.95
	Bird 6	3.48	2.83	1.48	2.26
Rep 2	Bird 7	4.72	3.51	2.00	2.18
	Bird 8	3.43	2.81	2.45	2.00
	Bird 9	4.13	3.05	2.08	1.60
	Bird 10	3.54	2.87	2.40	1.90
	Bird 11	3.77	2.95	3.09	1.78
	Bird 12	3.36	2.92	3.30	1.95
Rep 3	Bird 13	4.62	2.98	3.16	2.41
	Bird 14	3.33	4.33	1.85	2.15
	Bird 15	5.03	3.06	2.23	2.95
	Bird 16	4.41	3.07	2.00	1.95
	Bird 17	4.02	2.83	3.11	2.67
	Bird 18	3.45	3.46	2.36	2.08
Rep 4	Bird 19	3.94	2.99	2.15	2.90
	Bird 20	5.45	3.79	1.85	2.28
	Bird 21	3.69	2.54	2.38	2.11
	Bird 22	4.22	2.71	2.11	2.43
	Bird 23	4.13	2.80	1.70	2.00
	Bird 24	4.00	3.32	2.46	3.06
<b>Log Mean</b>		3.99	3.11	2.30	2.31
<b>Std Dev</b>		0.60	0.40	0.50	0.54
<b>Geom Mean</b>		9697.65	1294.44	201.26	202.81
<b>Significance</b>				Plant / Water to Safe <sub>2</sub> O PW @ p < 0.01	Plant / Water to TSP @ p < 0.01

Test Material	Tested pH
Water	7.54
Safe <sub>2</sub> O™-Poultry Wash	1.22
TSP	12.18

**TABLE 2: E. coli Count on Fresh Chicken Carcasses Post-Application**

<i>E. Coli</i>		Safe <sub>2</sub> O™ Poultry			
Sample	Plant Run log <sub>10</sub> /ml	Water log <sub>10</sub> /ml	Wash (log <sub>10</sub> /ml)	TSP log <sub>10</sub> /ml	
Rep 1	Bird 1	2.04	1.15	0.00	0.30
	Bird 2	2.69	1.38	1.11	0.00
	Bird 3	2.40	1.76	0.85	1.15
	Bird 4	2.18	1.65	0.00	0.30
	Bird 5	2.32	1.18	0.00	1.72
Rep 2	Bird 6	2.56	1.68	0.00	1.69
	Bird 7	4.07	1.20	0.00	0.48
	Bird 8	2.57	0.85	0.60	0.00
	Bird 9	2.75	0.85	0.00	0.30
	Bird 10	2.34	1.46	0.60	1.00
Rep 3	Bird 11	2.62	1.40	2.41	0.60
	Bird 12	2.48	1.30	0.60	0.78
	Bird 13	2.73	1.32	0.70	0.00
	Bird 14	2.54	1.91	0.00	0.30
	Bird 15	2.30	0.78	0.60	0.60
Rep 4	Bird 16	2.57	1.28	0.00	0.90
	Bird 17	3.90	0.00	0.00	1.00
	Bird 18	2.43	1.43	0.85	0.00
	Bird 19	3.11	1.32	0.78	0.70
	Bird 20	3.72	1.43	0.70	0.78
	Bird 21	2.90	1.23	1.15	0.00
	Bird 22	1.78	1.04	0.00	0.78
	Bird 23	2.78	0.90	0.70	0.70
	Bird 24	2.65	2.28	0.78	1.34
<b>Log Mean</b>		2.68	1.28	0.52	0.64
<b>Std Dev</b>		0.55	0.44	0.57	0.51
<b>Geom Mean</b>		483.71	19.16	3.30	4.39
<b>Significance</b>			Plant / Water to Safe <sub>2</sub> O PW @ p < 0.01	Plant / Water to TSP @ p < 0.01	

Test Material	Tested pH
Water	7.54
Safe <sub>2</sub> O™ Poultry Wash	1.22
TSP	12.18

**TABLE 3: *Campylobacter jejuni* Count on Fresh Chicken Carcasses Post Application**

<i>Campylobacter</i>		Safe <sub>2</sub> O™-Poultry			
Sample	Plant Run log <sub>10</sub> /ml	Water log <sub>10</sub> /ml	Wash (log <sub>10</sub> /ml)	TSP log <sub>10</sub> /ml	
Rep 1	Bird 1	2.68	2.49	0.00	0.00
	Bird 2	2.32	1.78	0.00	0.00
	Bird 3	2.00	1.70	1.00	1.00
	Bird 4	2.45	1.90	0.00	0.00
	Bird 5	2.04	1.48	0.00	0.00
	Bird 6	2.59	1.00	0.00	0.00
Rep 2	Bird 7	2.88	2.15	0.00	0.00
	Bird 8	2.18	1.30	0.00	0.00
	Bird 9	2.52	1.95	0.00	0.00
	Bird 10	2.26	1.48	0.00	0.00
	Bird 11	2.18	1.30	0.00	0.00
	Bird 12	2.15	0.00	1.00	0.00
Rep 3	Bird 13	1.95	1.60	0.00	0.00
	Bird 14	1.85	0.00	0.00	1.00
	Bird 15	2.36	0.00	0.00	0.00
	Bird 16	2.40	1.00	0.00	0.00
	Bird 17	2.52	1.30	0.00	0.00
	Bird 18	2.45	1.00	0.00	0.00
Rep 4	Bird 19	2.94	1.00	1.70	0.00
	Bird 20	2.58	2.04	0.00	1.00
	Bird 21	3.41	2.20	0.00	1.00
	Bird 22	2.59	0.00	0.00	0.00
	Bird 23	3.49	1.70	0.00	1.70
	Bird 24	2.38	2.76	0.00	0.00
<b>Log Mean</b>		2.47	1.38	0.15	0.24
<b>Std Dev</b>		0.41	0.78	0.43	0.49
<b>Geom Mean</b>		292.02	24.01	1.43	1.73

**Significance**

Plant / Water to Safe<sub>2</sub>O PW

@ p < 0.01

Plant / Water to TSP

@ p < 0.01

**Test Material**

**Tested pH**

Water

7.54

Safe<sub>2</sub>O™-Poultry  
Wash

1.22

TSP

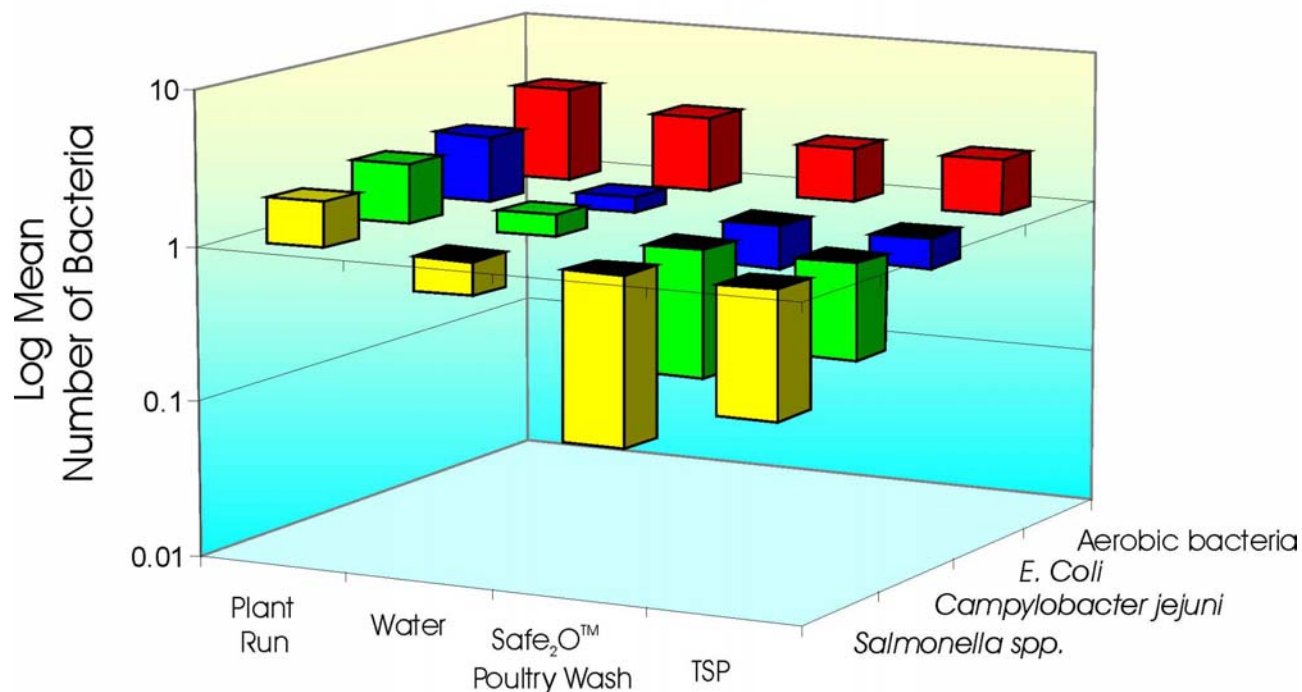
12.18

**TABLE 4: *Salmonella* spp. Count on Fresh Chicken Carcasses Post Application**

<i>Salmonella</i>		Safe <sub>2</sub> O™-Poultry			
Sample	Plant Run log <sub>10</sub> /ml	Water log <sub>10</sub> /ml	Wash (log <sub>10</sub> /ml)	TSP log <sub>10</sub> /ml	
Rep 1	Bird 1	1.90	0.00	0.00	0.00
	Bird 2	1.70	0.00	0.00	0.00
	Bird 3	1.70	0.00	0.00	0.00
	Bird 4	1.85	0.00	0.00	1.00
	Bird 5	2.00	1.00	0.00	0.00
	Bird 6	1.90	0.00	0.00	0.00
Rep 2	Bird 7	1.30	1.60	0.00	0.00
	Bird 8	2.28	1.48	0.00	0.00
	Bird 9	2.32	1.00	0.00	0.00
	Bird 10	2.04	1.00	0.00	0.00
	Bird 11	2.15	1.00	1.95	0.00
	Bird 12	2.00	0.00	0.00	0.00
Rep 3	Bird 13	1.85	0.00	0.00	0.00
	Bird 14	1.78	1.00	0.00	1.48
	Bird 15	1.60	0.00	0.00	1.00
	Bird 16	1.85	1.30	0.00	0.00
	Bird 17	1.78	0.00	0.00	0.00
	Bird 18	1.78	1.00	0.00	0.00
Rep 4	Bird 19	2.53	1.00	0.00	0.00
	Bird 20	2.18	0.00	0.00	0.00
	Bird 21	2.28	1.00	0.00	0.00
	Bird 22	2.32	0.00	0.00	0.00
	Bird 23	2.00	1.00	0.00	0.00
	Bird 24	2.36	1.00	0.00	0.00
<b>Log Mean</b>		1.98	0.60	0.08	0.15
<b>Std Dev</b>		0.29	0.58	0.40	0.40
<b>Geom Mean</b>		94.86	3.97	1.21	1.40
<b>Significance</b>			Plant / Water to Safe <sub>2</sub> O PW @ p < 0.01	Plant / Water to TSP @ p < 0.01	

Test Material	Tested pH
Water	7.54
Safe <sub>2</sub> O™	1.22
Poultry Wash	
TSP	12.18

## Summary of the Antimicrobial Efficacy of Mionix Safe<sub>2</sub>O™<sub>brand</sub> Poultry Wash Treatment on Fresh Chicken Carcasses



## AGRICULTURAL RESEARCH SERVICE STUDY

### SUMMARY

The number of *E. coli*, *Salmonella spp.* and *Campylobacter jejuni* microorganisms associated with Safe<sub>2</sub>O™<sub>brand</sub> Poultry Wash treated carcasses wash significantly reduced relative to plant run controls. Safe<sub>2</sub>O™<sub>brand</sub> Poultry Wash treatment was slightly more effective than TSP.