

Research Notes

Passport Food Safety Solutions



BoviBrom reduced *E. coli* and *Salmonella* as effectively as hot water

STUDY OVERVIEW

This study's objective was to evaluate the efficacy of BoviBrom® as an antimicrobial intervention in reducing aerobic plate counts (APC), *Enterobacteriaceae* (EBC), *E. coli* O157:H7 and *Salmonella* on inoculated fresh meat surfaces. Treatments were evaluated using two different systems: a commercial carcass wash cabinet and a model carcass washer. Sections of beef flank muscle and heart were inoculated with bovine fecal solution containing approximately 6_{Log} CFU/cm² of *E. coli* O157:H7 and *Salmonella*.

- Two treatments
 - Hot water – 185°F at nozzles, 20 psi, 12 sec (flank) and 28 sec (heart), 1.8 gal/min
 - BoviBrom – 77°F, 35 psi, 12 sec (flank) and 28 sec (heart), 2.6 gal/min
- Simulated for 300 head/hour chain speed
- BoviBrom pH level
 - 75 ppm – 6.84 pH
 - 175 ppm – 6.76 pH
 - 270 ppm – 6.71 pH
- Excised samples taken before and after treatment
 - After treatment, samples were measured immediately and again after being chilled for 48 hours at 39°F
 - Enumerated for:
 - o APC
 - o EBC
 - o *E. coli* O157:H7
 - o *Salmonella*

RESULTS

BoviBrom treatments reduced APC, EBC, *E. coli* O157:H7 and *Salmonella* by the same or slightly lower amounts relative to hot water treatment. After 48 hours of storage, the reduction of organisms by BoviBrom and hot water treatments did not change. The study demonstrated that BoviBrom spray washing at 25°C could improve microbiological safety of beef carcasses and variety meats.

Figure 1: Percentage of pathogenic samples below the detection limit

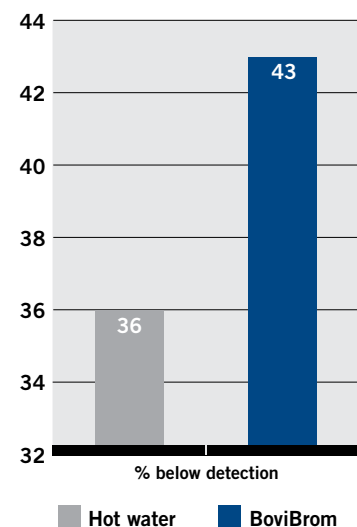


TABLE 1 Commercial carcass wash log reduction of APC, EBC and <i>E. coli</i> O157:H7				
	Treatment	APC	EBC	<i>E. coli</i> O157:H7
Flank	Hot Water	3.5*	3.9	1.8
	BoviBrom	3.3	3.1	1.8
Heart	Hot Water	4.1	4.1	2.2
	BoviBrom	3.6	3.4	2.1

*Means in the same column within tissue type did not differ significantly $P > 0.05$.

TABLE 2 Model carcass wash log reduction of APC, EBC, <i>E. coli</i> O157:H7, <i>Salmonella</i>					
	Treatment	APC	EBC	<i>E. coli</i> O157:H7	<i>Salmonella</i>
Flank	Hot Water	3.0 ^d	3.3 ^d	2.3 ^d	2.5 ^d
	BoviBrom	2.5 ^e	2.1 ^e	1.5 ^e	1.3 ^e
Heart	Hot Water	3.8 ^x	3.4 ^x	2.4 ^x	2.8 ^x
	BoviBrom	3.0 ^y	2.7 ^y	1.9 ^y	2.3 ^y

^d and E, and X and Y (log reduction per square centimeter) denote means in the same column within the column, and tissue types across treatments bearing the common letter do not differ significantly at $P \leq 0.05$.

CONCLUSION

- BoviBrom® at 270 ppm is as effective as hot water in a commercial carcass wash system
- BoviBrom did not cause “graying” of carcass lean tissue
- BoviBrom is effective using room temperature water
- BoviBrom is applied at near neutral pH, making it equipment and worker friendly
- BoviBrom can be reused in downstream applications, resulting in cost and water savings

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1 Kalchayanad N, et al. Effectiveness of 1,3-Dibromo-5,5 Dimethylhydantoin on Reduction of *Escherichia coli* O157:H7- and *Salmonella*-Inoculated Fresh Meat. *Journal of Food Protection*. 2009;72:151-156.