



Research article

Sanitization of food-grade materials: Combined effect of an enzymatic product and two chemical sanitizers on *Listeria monocytogenes* biofilms

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Supplementary

Table S1. One-way Analysis of Variance (ANOVA) with a significance at a 99% confidence level ($\alpha = 0.01$) on analytical techniques tested to optimize the formation/detachment protocol.

ONE-WAY ANOVA (a/b)						
SUMMARY						
Groups	N	Sum	Mean	Variance		
v	24	151,86	6,3275	0,59715		
s	24	160,72	6,696667	0,528423		
ANOVA						
Origin of the variation	SQ	dof	MQ	F	Significance value	F crit
Between groups	1,635408	1	1,635408	2,905912	0,095001553	7,220042
Within groups	25,88818	46	0,562787			
Total	27,52359	47				
ONE-WAY ANOVA (b/c)						
SUMMARY						
Groups	N	Sum	Mean	Variance		
b	24	160,72	6,696667	0,528423		
c	24	173,08	7,211667	0,445093		
ANOVA						
Origin of the variation	SQ	dof	MQ	F	Significance value	F crit
Between groups	3,1827	1	3,1827	6,538568	0,01391946	7,220042
Within groups	22,39087	46	0,486758			
Total	25,57357	47				
ONE-WAY ANOVA (a/c)						
SUMMARY						
Groups	N	Sum	Mean	Variance		
a	24	151,86	6,3275	0,59715		
c	24	173,08	7,211667	0,445093		
ANOVA						
Origin of the variation	SQ	dof	MQ	F	Significance value	F crit
Between groups	9,381008	1	9,381008	18,00158	0,000105672	7,220042
Within groups	23,97158	46	0,521121			
Total	33,35259	47				

Table S2. Two-way Analysis of Variance (ANOVA) with a significance at a 99% confidence level ($\alpha = 0.01$) on SS and PTFE inoculated tiles, to assess any statistical difference between techniques, strains, or materials.

ANOVA—Two Way Descriptive Statistics material for ALC							
Material							
	N	Mean	SD	SEM	Variance	Missing	NonMissing
SS	6	5.88167	1.8352	0.749219	3.36798	0	6
PTFE	6	4.64667	2.97464	1.21439	8.84851	0	6
Treatment							
	N	Mean	SD	SEM	Variance	Missing	NonMissing
ALC	6	3.26833	1.65898	0.677276	2.75222	0	6
ENZ + ALC	6	7.26	0.905185	0.36954	0.81936	0	6
Overall							
	N	Mean	SD	SEM	Variance	Missing	NonMissing
	12	5.26417	2.44314	0.705273	5.96892	0	12
Interaction							
	N	Mean	SD	SEM	Variance	Missing	NonMissing
SS ALC	3	4.35667	1.18745	0.685574	1.41003	0	3
ENZ + ALC	3	7.40667	0.181751	0.104934	0.0330333	0	3
PTFE ALC	3	2.18	1.38459	0.799396	1.9171	0	3
ENZ + ALC	3	7.11333	1.39672	0.806398	1.95083	0	3
Overall ANOVA							
	DF	Sum of Squares	Mean Square	F Value	P Value		
material	1	4.57567	4.57567	3.44619	0.100486		
treatment	1	47.8002	47.8002	36.0009	3.23366E-4		
Interaction	1	2.66021	2.66021	2.00355	0.194661		
Model	3	55.0361	18.3454	13.8169	0.00157263		
Error	8	10.622	1.32775				
Corrected Total	11	65.6581					
At the 0.01 level, the population means of material are not significantly different.							
At the 0.01 level, the population means of treatment are significantly different.							
At the 0.01 level, the interaction between material and treatment is not significant.							

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ANOVA—Two Way Descriptive Statistics material for QAC

Material		N	Mean	SD	SEM	Variance	Missing	NonMissing
SS		6	5.20167	1.58858	0.648534	2.52358	0	6
PTFE		6	6.965	0.714416	0.291659	0.51039	0	6
Treatment		N	Mean	SD	SEM	Variance	Missing	NonMissing
QAC		6	5.20167	1.58858	0.648534	2.52358	0	6
ENZ + QAC		6	6.965	0.714416	0.291659	0.51039	0	6
Overall		N	Mean	SD	SEM	Variance	Missing	NonMissing
		12	6.08333	1.49234	0.430801	2.22708	0	12
Interaction		N	Mean	SD	SEM	Variance	Missing	NonMissing
SS	QAC	3	3.88	0.640937	0.370045	1.41003	0	3
	ENZ + QAC	3	6.52333	0.811008	0.468235	0.0330333	0	3
PTFE	QAC	3	6.52333	0.811008	0.468235	1.9171	0	3
	ENZ + QAC	3	7.40667	0.181751	0.104934	1.95083	0	3
Overall ANOVA								
		DF	Sum of Squares	Mean Square	F Value	P Value		
material		1	9.32803	9.32803	21.2085	0.0017434		
treatment		1	9.32803	9.32803	21.2085	0.0017434		
Interaction		1	2.3232	2.3232	5.2821	0.0506064		
Model		3	20.9793	6.99309	15.8997	9.85201E-4		
Error		8	3.5186	0.439825				
Corrected Total		11	24.4979					

At the 0.01 level, the population means of material are significantly different.

At the 0.01 level, the population means of treatment are significantly different.

At the 0.01 level, the interaction between material and treatment is not significant.

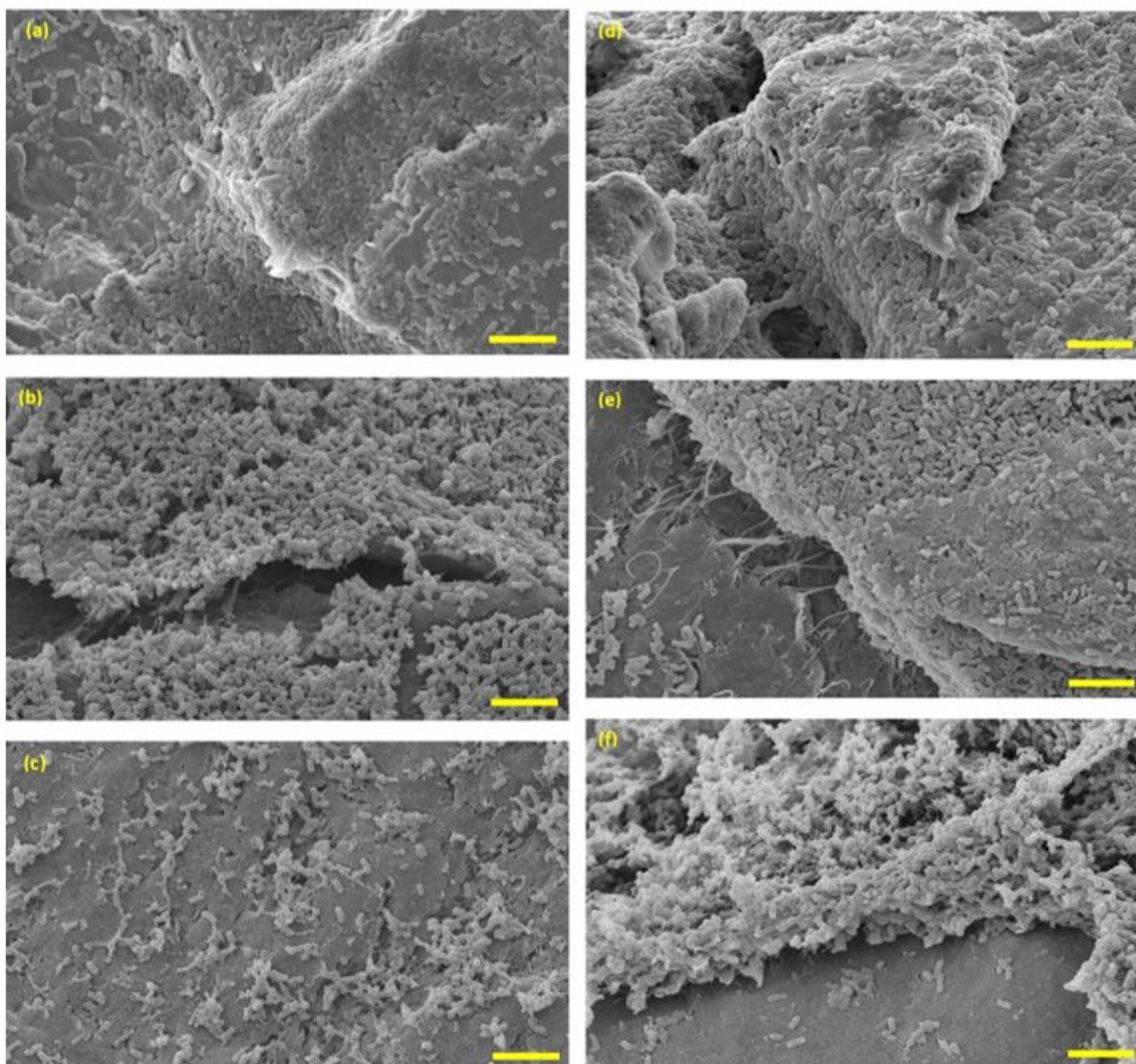


Figure S1. Supplementary material No.3. *Listeria* biofilms on SS [(a) *L. monocytogenes* Scott A; (b) *L. monocytogenes* SSICA COI; (c) *L. monocytogenes* SSICA AFI] or on PTFE [(d) *L. monocytogenes* Scott A; (e) *L. monocytogenes* SSICA COI; (f) *L. monocytogenes* SSICA AFI] captured by a Scanning Electron microscope (SEM) at 3,000 magnifications. Scale bar = 5 µm.



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