

## SUPPLEMENTARY MATERIAL

### Inhibiting potential of selected lactic acid bacteria isolated from Costa Rican agro-industrial waste against *Salmonella* sp. in yogurt

Valeria Piedra,<sup>1</sup> Jessie Usaga,<sup>2</sup> Mauricio Redondo-Solano,<sup>3</sup> Lidieth Uribe-Lorío,<sup>4</sup>  
Carol Valenzuela-Martínez,<sup>2,3</sup> Natalia Barboza<sup>1,2</sup>

<sup>1</sup>Food Technology Department, University of Costa Rica, San Pedro; <sup>2</sup>National Center of Food Science and Technology, University of Costa Rica, San Pedro; <sup>3</sup>Research Center for Tropical Diseases and Food Microbiology Research and Training Laboratory, College of Microbiology, University of Costa Rica, San Pedro; <sup>4</sup>Agronomic Research Center, Agronomy Department, University of Costa Rica, San Pedro, Costa Rica.

**Correspondence:** Natalia Barboza, Food Technology Department, University of Costa Rica, San Pedro, Costa Rica.

Tel.: +(506) 2511-7222

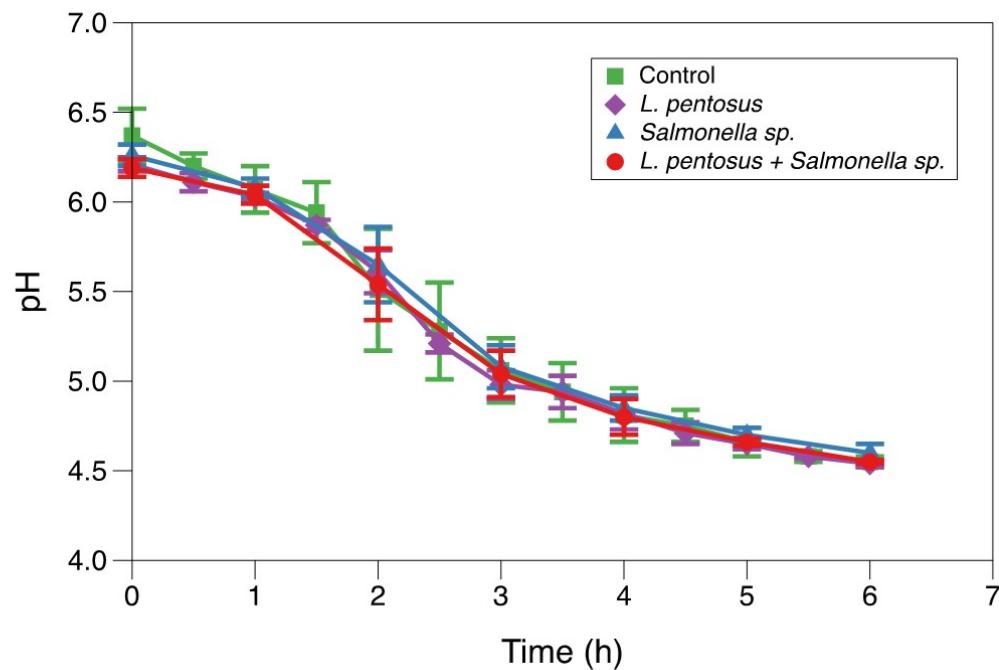
E-mail: [natalia.barboza@ucr.ac.cr](mailto:natalia.barboza@ucr.ac.cr)

**Key words:** bioprotective culture, food pathogens, *in vitro* assays.

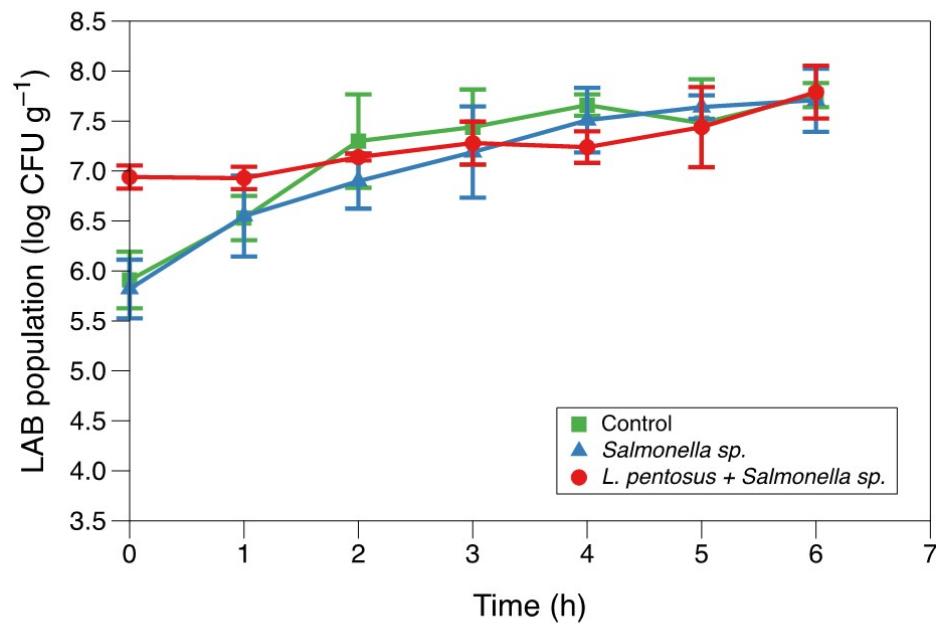
**Supplementary Table 1. Inhibition halo of *Salmonella enterica*, *Listeria monocytogenes*, *Staphylococcus aureus* 29213 and *Escherichia coli* 25922 grown on culture media pre-inoculated with different lactic acid bacteria strains isolated from agro-industrial waste.**

LAB strain	GenBank code	Isolation source	Halo			
			<i>Salmonella</i>	<i>L. monocytogenes</i>	<i>S. aureus</i>	<i>E. coli</i>
<i>Weissella soli_</i> 29-5(1)	ON763313	Carrot waste residues	+	+	+	+
<i>Weissella soli_</i> 30-6(3)	ON763314	Carrot waste residues	+	+	+	+
<i>Weissella soli_</i> 31-2(9B)	ON763315	Carrot waste residues	+	+	+	+
<i>Lactiplantibacillus pentosus_</i> 16-6(1C)	ON763300	Coffee brush	+	+	+	+
<i>Leuconostoc pseudomesenteroides_</i> 18-(1B)	ON763310	Coffee brush	++	+	+	+
<i>Lactobacillus pentosus_</i> 19-(3A)	ON763312	Coffee brush	+	+	+	+
<i>Lactobacillus pentosus_</i> 19-(5A)	ON763302	Coffee brush	+	+	+	+
<i>Leuconostoc_</i> 66-2(4A)	ON763311	Orange waste residuals	+	+	+	+
<i>Levilactobacillus brevis_</i> 68-6(1C)	ON763329	Orange waste residuals	+	+	+	+
<i>Lactobacillus plantarum_</i> 69-2(3D)	ON763306	Orange waste residuals	+	+	+	+
<i>Lactobacillus pentosus_</i> 70-6(1E)	ON763307	Orange waste residuals	+	+	+	+
<i>Lactobacillus plantarum</i> subsp. <i>plantarum_</i> 70-6(13E)	ON763327	Orange waste residuals	+	+	+	+
<i>Lacticaseibacillus paracasei_</i> P2	ON763288	MFC of coffee effluent	+	+	+	+
<i>Lacticaseibacillus paracasei_</i> P4	ON763289	MFC of coffee effluent	+	+	+	+
<i>Lacticaseibacillus paracasei_</i> P6	ON763290	MFC of coffee effluent	+	+	+	+
<i>Lacticaseibacillus paracasei_</i> P8	ON763291	MFC of coffee effluent	+	+	+	+
<i>Lacticaseibacillus paracasei_</i> P9	ON763292	MFC of coffee effluent	+	+	+	+
<i>Lacticaseibacillus paracasei_</i> P10	ON763293	MFC of coffee effluent	+	+	+	+
<i>Lacticaseibacillus paracasei_</i> P13	ON763294	MFC of coffee effluent	+	+	+	+
<i>Limosilactobacillus fermentum_</i> 56(6)-2F	ON763317	Trinitario cocoa	+++	+	+	+
<i>Limosilactobacillus fermentum_</i> 56(6)-1F	ON763318	Trinitario cocoa	+	+	+	+
<i>Limosilactobacillus fermentum_</i> 56(7)-1G	ON763319	Trinitario cocoa	+	+	+	+
<i>Limosilactobacillus fermentum_</i> 57(7)-2H	ON763324	Trinitario cocoa	++	+	+	+
<i>Limosilactobacillus fermentum_</i> 58(7)-1J	ON763325	Trinitario cocoa	+	+	+	++
<i>Limosilactobacillus fermentum_</i> 78(6)-1A	ON763321	Trinitario cocoa	+	+	+	+
<i>Pediococcus acidilactici_</i> 78(6)-3A	ON763330	Trinitario cocoa	++	++	+	+
<i>Limosilactobacillus fermentum_</i> 78(6)-2A	ON763322	Trinitario cocoa	+	+	+	+
<i>Limosilactobacillus fermentum_</i> 79(6)-1D	ON763323	Trinitario cocoa	+	+	+	+
<i>Weissellahanensis_</i> 80(6)-1E	ON763316	Trinitario cocoa	+	+	+	+

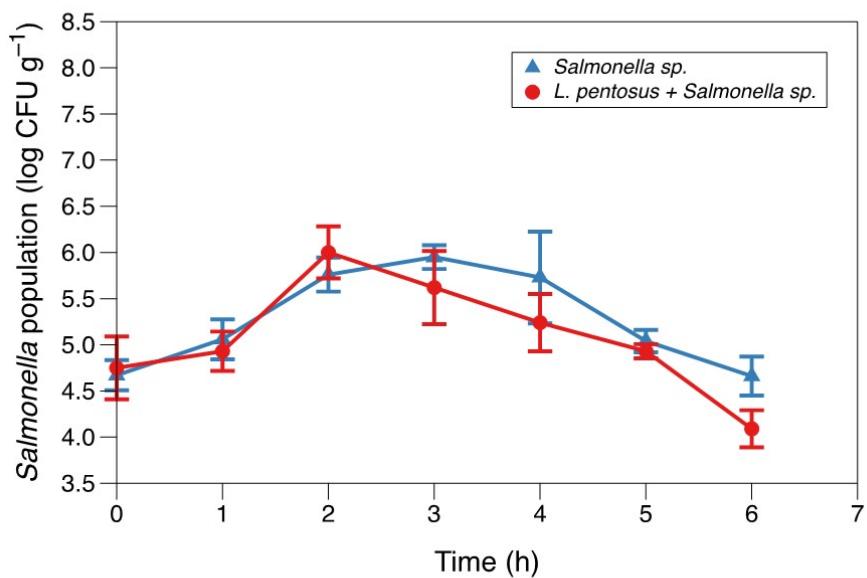
+ Inhibition zone 0- 3 mm in diameter (weak), ++ inhibition zone 3- 6 mm in diameter (good), +++ inhibition zone larger than 6 mm in diameter (strong). MFC=microbial fuel cells.



**Supplementary Figure 1.** pH values during fermentation of yogurt subjected to different inoculation treatments (means, error bars show the standard deviation for n=3).



**Supplementary Figure 2.** Lactic acid bacteria count during fermentation of yogurt subjected to different inoculation treatments (means, error bars show the standard deviation for n=3).



**Supplementary Figure 3.** *Salmonella* sp. counts during fermentation of yogurt subjected to different inoculation treatments (means, error bars show the standard deviation for n=3).