

Supplementary Table 1. Radical scavenging activity of whey and soy whey generated as by-products of *chhurpi* and soy *chhurpi* production using selected LAB strains.

Fermenting starter	DPPH radical scavenging activity (mg AAE/g sample)	SRSA (mg AAE/g sample)	Reducing power potential (mg AAE/g sample)	TAA (mg AAE/g sample)
Whey				
<i>L. delbrueckii</i> WS15	0.061 ± 0.003 ^c	1.07 ± 0.07 ^b	0.18 ± 0.01 ^b	1.24 ± 0.04 ^c
<i>L. delbrueckii</i> WS28	0.065 ± 0.004 ^c	1.05 ± 0.10 ^b	0.18 ± 0.01 ^b	1.20 ± 0.01 ^c
<i>L. delbrueckii</i> WS12	0.124 ± 0.008 ^b	1.49 ± 0.07 ^a	0.41 ± 0.02 ^a	2.32 ± 0.05 ^b
<i>L. delbrueckii</i> WS4	0.170 ± 0.022 ^a	1.59 ± 0.07 ^a	0.38 ± 0.01 ^a	2.54 ± 0.09 ^a
<i>E. durans</i> ES93	0.126 ± 0.003 ^b	1.19 ± 0.05 ^b	0.37 ± 0.04 ^a	2.54 ± 0.02 ^a
Soy whey				
<i>L. delbrueckii</i> WS15	0.127 ± 0.003 ^c	0.45 ± 0.02 ^c	0.15 ± 0.01 ^b	1.12 ± 0.02 ^d
<i>L. delbrueckii</i> WS28	0.145 ± 0.004 ^d	0.39 ± 0.02 ^c	0.19 ± 0.02 ^b	1.32 ± 0.03 ^c
<i>L. delbrueckii</i> WS12	0.220 ± 0.004 ^b	0.78 ± 0.03 ^a	0.36 ± 0.01 ^a	1.88 ± 0.02 ^b
<i>L. delbrueckii</i> WS4	0.244 ± 0.003 ^a	0.82 ± 0.02 ^a	0.40 ± 0.01 ^a	2.12 ± 0.04 ^a
<i>E. durans</i> ES93	0.183 ± 0.006 ^c	0.57 ± 0.02 ^b	0.19 ± 0.01 ^b	1.20 ± 0.03 ^d

DPPH – 2,2-diphenyl-1-picrylhydrazyl; SRSA – superoxide radical scavenging activity; TAA – total antioxidant activity; AAE – ascorbic acid equivalent.

Supplementary Table 2. ACE molecular docking of antihypertensive activity predicted 9 (nona) and 10 (deca) residue peptides identified in whey and soy whey released during cheese production using *L. delbrueckii* WS4.

Peptide	Peptidyl residue	ACE residue	Interaction type	Bond distance (Å)	Binding (kcal/mol)	Energy
Whey						
HQVLPLPLQL	LEU6	HIS387	π Alkyl	4.62	-12.5	
	LEU4	HIS387	π Alkyl	4.95		
	VAL3	HIS383	π Alkyl	5.36		
	VAL3	TYR520	π Alkyl	5.42		
	LEU4	ALA354	Alkyl	5.14		
	PRO5	ALA354	Carbon Hydrogen Bond	1.78		
	PRO5	HIS513	π Alkyl	4.63		
FVAPFPEVF	LEU4	GLU384	Carbon Hydrogen Bond	2.47	-13.2	
	VAL8	HIS513	Carbon Hydrogen Bond	3.02		
	GLU7	HIS513	Carbon Hydrogen Bond	2.51		
	PHE9	HIS383	CHB	2.17		
	VAL8	ALA354	Alkyl	2.89		
	VAL8	HIS353	π Alkyl	3.98		
	VAL8	GLU384	Carbon Hydrogen Bond	2.54		
PVRGPFPIIV	PHE9	TYR523	π - π Pi Stacked	4.79	-11.8	
	VAL2	HIS513	Carbon Hydrogen Bond	1.53		
	ARG3	HIS353	Carbon Hydrogen Bond	2.61		
	VAL2	HIS353	Carbon Hydrogen Bond	2.50		
	GLY4	HIS353	CHB	2.77		
	ARG3	HIS383	π Alkyl	3.54		
	VAL2	LYS511	CHB	2.93		
	VAL2	HIS513	Carbon Hydrogen Bond	1.53		
	ARG3	TYR523	π Alkyl	5.31		
	ARG3	GLU411	Attractive Charge	5.51		

	ARG3	GLU384	Carbon Hydrogen Bond	2.28	
	ARG3	GLU384	CHB	2.66	
NLHLPLPLLQ	HIS3	HIS353	CHB	2.84	-12.8
	HIS3	GLU384	CHB	1.59	
	HIS3	HIS387	π Lone Pair	2.58	
	HIS3	HIS387	π Lone Pair	2.93	
	HIS3	HIS387	π - π Stacked	3.39	
	LEU4	ALA354	CHB	2.85	
	ASN1	TYR520	CHB	1.84	
NLHLPLPL	HIS3	HIS513	CHB	2.65	-11.1
	HIS3	GLU384	CHB	2.42	
	HIS3	GLU384	CHB	2.44	
	HIS3	HIS387	π - π Stacked	3.34	
	HIS3	HIS387	π Lone Pair	2.79	
	HIS3	GLU411	Carbon Hydrogen Bond	2.62	
	LEU4	ALA354	CHB	2.68	
LPLPLLQSW	LEU3	HIS410	π Sigma	2.70	-9.7
LPLPLLQ	LEU5	HIS387	π Sigma	1.75	-10.5
	LEU6	HIS353	Carbon Hydrogen Bond	2.45	
	GLN7	GLU411	CHB	1.53	
LHLPLPLLQ	LEU3	HIS387	π Alkyl	4.17	-11.6
	LEU1	HIS513	π Alkyl	4.49	
	LEU1	HIS353	π Alkyl	3.69	
LHLPLPLL	LEU8	GLU411	Carbon Hydrogen Bond	2.31	-12.2
YQKFALPQYL	GLN2	HIS353	Carbon Hydrogen Bond	2.76	-12.2
	TYR1	ALA354	Carbon Hydrogen Bond	1.67	
VPPFLQPEVM	LEU5	HIS387	π Alkyl	5.13	-10.7
	GLN6	HIS387	Carbon Hydrogen Bond	2.84	
	GLN6	GLU384	CHB	2.61	
VENLHLPLPL	LEU8	HIS353	π Alkyl	5.10	-12.0

	PRO9	HIS353	Carbon Hydrogen Bond	2.44	
	PRO9	ALA354	Alkyl	3.50	
	PRO9	HIS513	Carbon Hydrogen Bond	2.30	
	LEU10	TYR523	π Alkyl	4.25	
	LEU8	TYR523	CHB	2.69	
	LEU8	HIS383	π Alkyl	5.17	
	PRO7	HIS513	π Alkyl	3.39	
	LEU8	ALA354	Alkyl	3.43	
	LEU8	ALA354	CHB	2.98	
	PRO9	TYR523	π Alkyl	3.73	
	PRO9	TYR520	π Alkyl	4.89	
VYFPFGPIP	VAL3	HIS387	π Alkyl	3.78	-13.6
Soy whey					
KNKPLVVQF	VAL7	HIS513	π Alkyl	4.90	-13.8
	GLN8	TYR523	CHB	1.93	
	GLN8	ALA354	CHB	2.20	
	PHE9	TYR523	π Sigma	2.90	
	VAL7	ALA354	CHB	2.95	
	GLN8	HIS513	CHB	2.61	
DQNPRVFYL	PHE7	HIS383	π Lone Pair	2.87	-11.9
	PHE7	HIS383	CHB	2.13	
	LEU9	TYR523	π Alkyl	5.37	
	ARG5	HIS387	Carbon Hydrogen Bond	2.97	

ACE – angiotensin-I converting enzyme; CHB – conventional hydrogen bond.