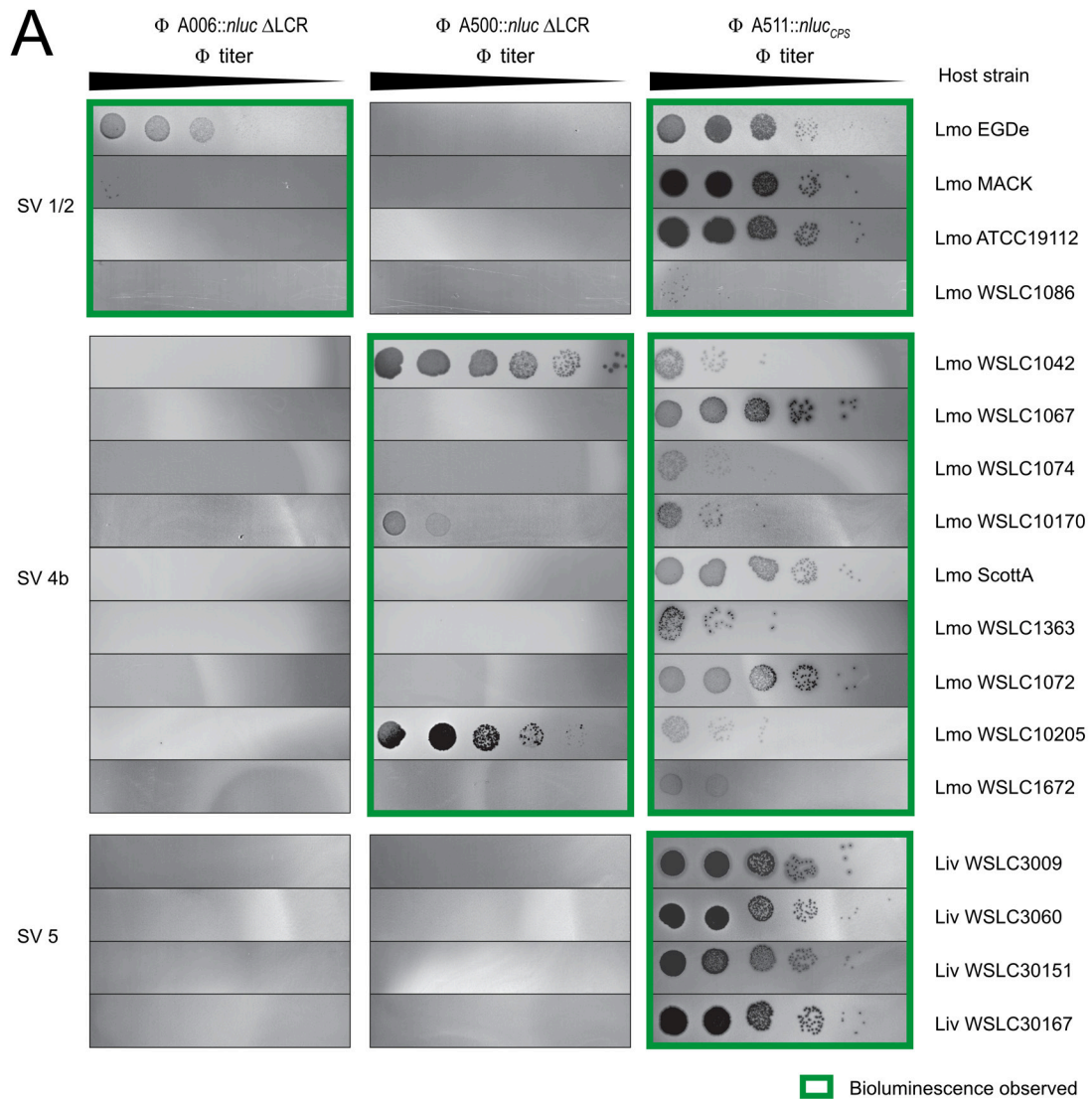
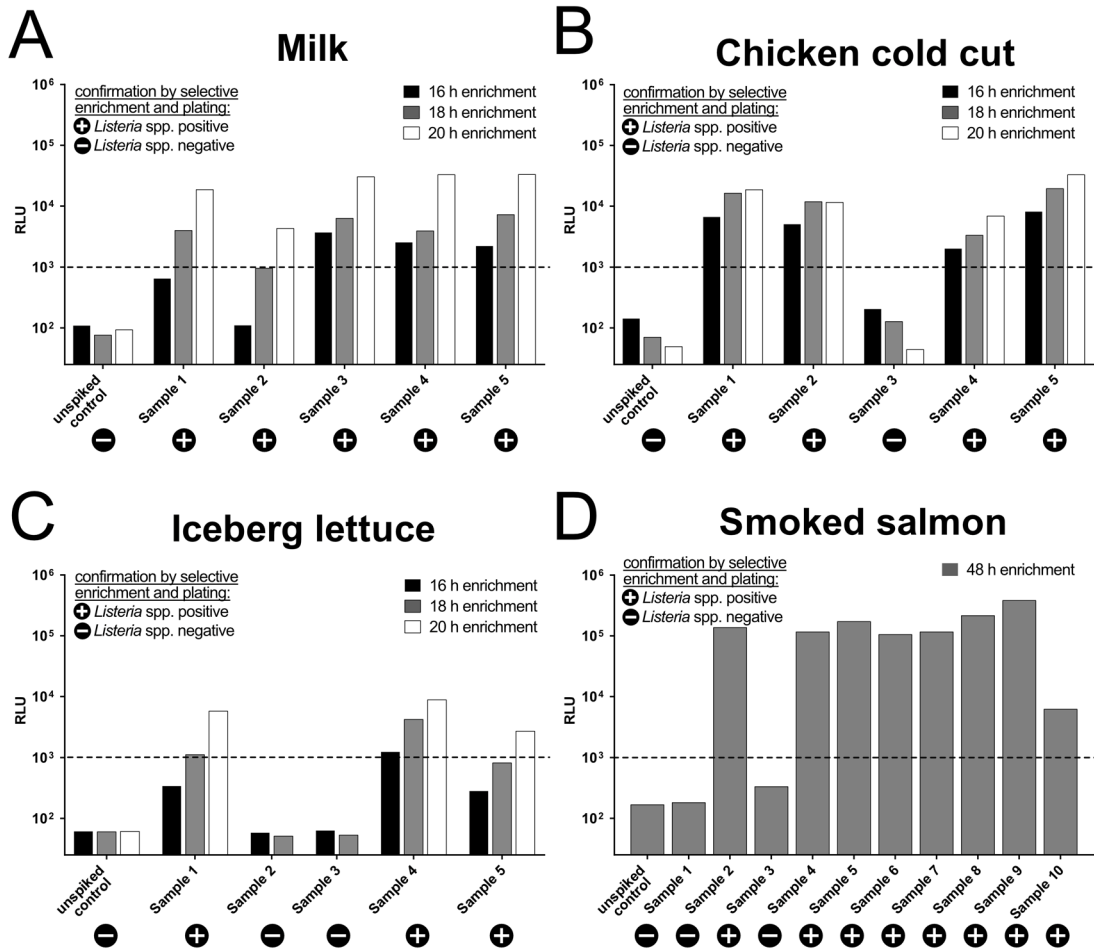


12 **Supplementary Figure S1: Genotypic and phenotypic analysis of engineered phages used in this**
 13 **study.** PCR verification and plaque morphologies of A006-derived phages (**A**) and A500-derived phages
 14 (**B**) are shown. Deletions of the lysogeny control regions (LCR-PCR) and correct insertion of luciferase
 15 sequences (Luciferase-PCR) were verified by PCR and plaque morphologies visualized from soft-agar
 16 overlays after 24 h of incubation. (**C**) Upon CRISPR-Cas-mediated counterselection, five individual
 17 plaques were picked and insertion of the heterologous *nluc* gene sequence into the *ply*- or *cps*-locus of
 18 A511-derived candidates was verified by PCR (“PLY locus PCR” and “CPS locus PCR”, respectively).
 19 Primers are listed in Table S1.



20 **Supplementary Figure S2: Phagotyping and SV differentiation of *Listeria* spp. by**
 21 **bioluminescence measurements and spot-on-the-lawn plaque assays. (A)** Indicated strains
 22 covering *Listeria* SVs 1/2, 4b, and 5 were infected with serial dilutions of the indicated phage using spot-
 23 on-the-lawn assays and plaque formation was visualized 24 h p.i. Host strains that produced a positive
 24 signal with the indicated phages in the bioluminescence assays are highlighted within green boxes.
 25



26

27 **Supplementary Figure S3: Bioluminescence-based detection of *Listeria* in artificially**
 28 **contaminated foods.** Bioluminescence (RLU) of artificially spiked milk (A), chicken cold cut (B), and
 29 iceberg lettuce (C) are shown after selective enrichment in full LEB (16, 18, and 20 h) and compared to
 30 results from culture-based detection of the same samples. Spiked salmon samples (D) were enriched
 31 for 48 h in 1/4 LEB. For each food matrix, one unspiked control was included. (+) culture positive for
 32 *Listeria*; (-) culture negative for *Listeria*. Samples were contaminated with ± 1 CFU / 25 g of food
 33 (quantified values: 1.4 ± 0.3 in milk, 1.1 ± 0.1 in chicken cold cut, 1.4 ± 0.1 in iceberg lettuce and $1.0 \pm$
 34 0.2 in smoked salmon, errors are STDEV of technical triplicates). Dotted lines = threshold for positive
 35 samples.

36 **Supplementary Table S1. *Listeria* detection in potentially contaminated food samples from**
 37 **commercial sources.** Exclusion = experimental clarification of unclear selective plating results; - = no
 38 growth or negative results; + = growth or positive results; +/- = some growth, untypical morphology; C.
 39 *citreum* = *Curtobacterium citreum*.

Food sample (anonym. vendor)	3M MDS	Selective plating		Reporter phage		Exclusion	API test API® <i>Listeria</i>
		Oxford	ALOA	Result	FC-value		
Pineapple pieces	-	-	-	-	1.42	nA	
Salad with beans and pomegranate	-	-	-	-	2.15	nA	
Alfa-alfa sprouts	-	-	-	-	1.20	nA	
Cheese "Mostkäse"	-	-	-	-	1.80	nA	
Salad with carrots, shaker	-	-	-	-	1.50	nA	
Salad, organic	-	-	-	-	0.05	nA	
Spicy thai basil	-	-	-	-	1.36	nA	
Cress	-	-	-	-	0.8	nA	
Mixed salad, organic	+	+	+	+	172222.22	nA	<i>L.grayi</i>
Onion sprouts	-	-	-	-	2.00	nA	
Rocket sprouts	-	-	-	-	2.09	nA	
Sprouts	-	-	-	-	1.65	nA	
Salmon	+	+	+	+	55.71	nA	<i>L.welshimeri</i>
Thai coriander	-	-	-	-	3.41	nA	
Greek salad	-	-	-	-	3.43	nA	
Mungbean sprouts, organic	-	-	-	-	3.41	nA	
Salad, organic	-	-	-	-	3.67	nA	
Coriander	-	-	-	-	3.39	nA	
Mixed salad	-	-	+/-	-	1.50	16S sequence (<i>C. citreum</i>)	
Salad	+	+	+	+	8150.00	nA	<i>L.welshimeri</i>
Microgreens	-	-	-	-	3.89	nA	
Mungbean sprouts	-	-	-	-	4.95	nA	
Mixed sprouts	-	-	-	-	1.70	nA	
Sweet basil	-	-	-	-	1.77	nA	
Mixed salad	-	-	+/-	-	1.49	Spore-forming	
Mixed sprouts	-	-	-	-	1.90	nA	
Cheese and ham salad	-	-	-	-	3.32	nA	
Thai coriander	-	-	-	-	2.00	nA	
Parsley	-	-	-	-	4.90	nA	
Salad	-	-	-	-	3.75	nA	
Thai celery	-	-	-	-	2.33	nA	
Basil	-	-	-	-	2.19	nA	
Rice sandwich with smoked salmon	-	-	-	-	1.67	nA	
Filled pimiento	-	-	-	-	2.30	nA	
Coriander	-	-	-	-	2.79	nA	
Thai basil	-	-	-	-	2.43	nA	
Salad, organic	+	+	+	+	19500.00	nA	<i>L.innocua</i>
Fleur-de-lis sprouts	-	-	-	-	1.51	nA	
Smoked salmon	-	-	-	-	2.22	nA	
Cicorino rosso	-	-	-	-	1.30	nA	
Chicken salad	-	-	-	-	1.93	nA	
Vietnamese coriander	-	-	-	-	2.17	nA	
Mixed sprouts (alfa-alfa and rocket)	-	-	+/-	-	1.98	Spore-forming	
Crayfish salad	-	-	-	-	1.52	nA	
Mixed sprouts	-	-	-	-	2.08	nA	
Salad	-	-	+/-	-	1.02	Spore-forming	
Smoked salmon with herbs	-	-	-	-	1.84	nA	
Egg and chicken salad	-	-	-	-	1.49	nA	

43 **Supplementary Table S3. Synthetic, codon-optimized luciferase DNA strings.**

Supplementary Table S3: Synthetic, codon-optimized luciferase DNA strings.

String	Sequence [5'-3']	Size [bp]
rluc	<p>ATCACTAGAGGAGGTAAAATATATATG GGTGGTCGTCGTGTTTCGTTGGGAAGTTTAC ATCTCTCGTGCTTTATGGTTAACTCGTGAACCAACTGCTTACTGGTTAATCGAAATCA ACACTACTCATTACCGTGGTTCGCTACTATGGCTTCTAAAGTTTACGATCCAGAACA ACGTAAACGATGATCACTGGTCCACAATGGTGGGCTCGTTGTAACAAATGAACGT TTTAGATTCTTCATCACTACTACGATTCTGAAAAACATGCTGAAAACGCTGTTATCT TCTTACATGGTAACGCTACTTCTTCTTACTTATGGCGTCATGTTGTTCCACATATCGA ACCAGTTGCTCGTTGTATCATCCCAGATTTAATCGGTATGGGTAAATCTGGTAAATCT GGTAACGGTTCCTACCGTTTATTAGATCATTACAAATACTTAACTGCTTGGTTCGAAT TATTAACCTTACCAAAAAAATCATCTTCGTTGGTCATGATTGGGGTTCTGCTTTAGC TTTCCATTACGCTTACGAACATCAAGATCGTATCAAAGCTATCGTTCATATGGAATCT 1085 GTTGTTGATGTTATCGAATCTTGGATGGGTTGGCCAGATATCGAAGAAGAATTAGCT TTAATCAAATCTGAAGAAGGTGAAAAAATGGTTTTAGAAAACAACCTTCTCGTTGAAAC TTTATTACCATCTAAAAATCATGCGTAAATTAGAACCAAGAAGATTTCGCTGCTTACTAG AACCATTCAAAGAAAAAGGTGAAGTTCGTCGTCCAACTTTATCTTGGCCACGTGAAAT CCCATTAGTTAAAGGTGGTAAACCAGATGTTGTTCAAATCGTTCGTAACATAACCGCT TACTTACGTGCTTCTGATGATTTACCAAAATTATTCATCGAATCTGATCCAGGTTTCTT CTCTAACGCTATCGTTGAAGGTGCTAAAAAATCCCAAACACTGAATTCGTTAAAGTT AAAGGTTTACATTTCTTACAAGAAGATGCTCCAGATGAAATGGGTAAATACATCAAATC TTTCGTTGAACGTGTTTTAAAAACGAACAA TAA ATCATA</p>	
gluc	<p>ATCACTAGAGGAGGTAAAATATATATG GGTGTTAAAGTTTTATTCGCTTTAATCTGTAT CGCTGTTGCTGAAGCTAAACCAACTGAAAACAACGAAGATTTCAACATCGTTGCTGTT GCTTCTAACTTCGCTACTACTGATTTAGATGCTGATCGTGGTAAATTACCAGGTAAAA AATTACCATTAGAAGTTTTAAAAGAAATGGAAGCTAACGCTCGTAAAGCTGGTTGTAC TCGTGGCTGTTAATCTGTTTATCTCATATCAAATGTACTCCAAAAATGAAAAAATTCA TCCCAGGTCGTTGTACTACTTACGAAGGTGATAAAGAATCTGCTCAAGGTGGTATCG 587 GTGAAGCTATCGTTGATATCCCAGAAATCCCAGGTTTCAAAGATTTAGAACCAATGGA ACAATTCATCGCTCAAGTTGATTTATGTGTTGATTGTACTACTGGTTGTTAAAAGGT TTAGCTAACGTTCAATGTTCTGATTTATTAATAAATGTTACCACAACGTTGCGCTAC ATTCGCTTCTAAAATACAAGGTCAAGTTGATAAAATCAAAGGTGCTGGTGGTGAT TAA ATCATA</p>	
nluc	<p>ATCACTAGAGGAGGTAAAATATATATG GTTTTCACTTTAGAAGATTCGTTGGTGATTG GCGTCAAACCTGCTGGTTACAACCTTAGATCAAGTTTTAGAACAAAGGTGGTGGTTCTTCT TTATTCCAAAACCTTAGGTGTTTCTGTTACTCCAATCCAACGTATCGTTTTATCTGGTG AAAACGGTTTAAAAATCGATATCCATGTTATCATCCCATACGAAGGTTTATCTGGTGA TCAAATGGGTCAAATCGAAAAAATCTTCAAAGTTGTTACCCAGTTGATGATCATCATT 545 TCAAAGTTATCTTACATTACGGTACTTTAGTTATCGATGGTGTACTCCAAACATGATC GATTACTTCGGTCGTCATACGAAGGTATCGCTGTTTTCGATGGTAAAAAATCACT GTTACTGGTACTTTATGGAACGGTAACAAAATCATCGATGAACGTTTAAATCAACCCAG ATGGTTCTTTATTATCCGTGTTACTATCAACGGTGTACTGGTTGGCGTTTATGTGA ACGTATCTTAGCT TAA ATCATA</p>	

Bold = RBS; italics = coding sequence; red = start and stop codon.

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47 **Supplementary Table S4.** Experimental set-up for measurement of reporter phage-induced
 48 bioluminescence.

Supplementary Table S4: Experimental set-up for measurement of reporter phage-induced bioluminescence.

Phage	Substrate	<i>L. monocytogenes</i> host strain	Infection time [min]	Culture Temp. [°C]	Substrate volume [μL]	Culture volume [μL]
ΦA500:: <i>luxAB</i> ΔLCR	Nonanal ¹⁾	WSLC 1042	180	30/20	5	95
ΦA500:: <i>rluc</i> ΔLCR	Coelenterazine ²⁾	WSLC 1042	140	30	50	50
ΦA500:: <i>gluc</i> ΔLCR	Coelenterazine ²⁾	WSLC 1042	140	30	50	50
ΦA500:: <i>nluc</i> ΔLCR	Furimazine ³⁾	WSLC 1042	180	30	50	50
ΦA500 ΔLCR	Coelenterazine ²⁾	WSLC 1042	140	30	50	50
	Furimazine ³⁾		180	30	50	50
	Nonanal ¹⁾		180	20	5	95
ΦA511:: <i>luxAB</i>	Nonanal ¹⁾	EGDe	180	20	5	95
ΦA511:: <i>nluc</i> CPS	Furimazine ³⁾	EGDe	180	30	50	50
ΦA511:: <i>nluc</i> PLY	Furimazine ³⁾	EGDe	180	30	50	50
ΦA511	Furimazine ³⁾	EGDe	180	30	50	50
	Nonanal ¹⁾			20	5	95
ΦA006:: <i>nluc</i> ΔLCR	Furimazine ²⁾	EGDe	180	30	50	50
ΦA006 ΔLCR	Furimazine ²⁾	EGDe	180	30	50	50

¹⁾ 0.35% nonanal in 70% EtOH

²⁾ Renilla Luciferase Assay System (Promega)

³⁾ Nano-Glo® Luciferase Assay System (Promega)

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