

Table S1. Complete results of TaqMan assay used to screen 24 raw milk samples for *Paenibacillus* spoilage potential

Spoilage growth category <sup>a</sup>	Milk sample	CFU/ml after 13°C enrichment for (β-gal positive count)			Colony screening results after 13°C milk enrichment for										Milk assessment following 21 d at 6°C			
					T = 0 h			T = 24 h			T = 48 h			Bacterial count (CFU/ml)	Predominant spoilage bacteria ( <i>rpoB</i> or 16S based identification) <sup>b</sup>			
		T = 0 h	T = 24 h	T = 48 h	Isolate ID	β-gal (+/+) <sup>c</sup>	TaqMan (C) <sup>d</sup>	<i>rpoB</i> based species ID	Isolate ID	β-gal (+/+) <sup>c</sup>	TaqMan (C) <sup>d</sup>	<i>rpoB</i> based species ID	Isolate ID			β-gal (+/+) <sup>c</sup>	TaqMan (C) <sup>d</sup>	<i>rpoB</i> based species ID
High	D-3	2	2	<1	FSL R7-644	-	>40	<i>Bacillus</i>	FSL R7-645	-	>40	<i>Bacillus</i>	NA	-	-	-	4.37 × 10 <sup>7</sup>	<i>Paenibacillus</i>
	D-4	4	15 (5)	153 (114)	FSL R7-677	-	>40	<i>Bacillus</i>	FSL R7-692	-	>40	<i>Bacillus</i>	FSL R7-708	+	21.69	<i>Paenibacillus</i>	9.33 × 10 <sup>6</sup>	<i>Paenibacillus</i>
					FSL R7-678	-	>40	<i>Bacillus</i>	FSL R7-693	+	22.56	<i>Paenibacillus</i>	FSL R7-709	-	>40	<i>Bacillus</i>		
													FSL R7-710	-	>40	<i>Bacillus</i>		
	C-4	30	29	313 (13)	FSL R7-674	-	>40	<i>Bacillus</i>	FSL R7-690	-	>40	<i>Bacillus</i>	FSL R7-704	-	>40	<i>Bacillus</i>	5.37 × 10 <sup>6</sup>	<i>Paenibacillus</i>
					FSL R7-675	-	>40	<i>Bacillus</i>	FSL R7-691	-	>40	<i>Bacillus</i>	FSL R7-705	-	>40	<i>Bacillus</i>		
					FSL R7-676	-	>40	<i>Bacillus</i>				FSL R7-706	+	25.18	<i>Paenibacillus</i>			
	C-3	27	23	197 (40)	FSL R7-646	-	>40	<i>Bacillus</i>	FSL R7-650	-	>40	<i>Bacillus</i>	FSL R7-652	+	18.9	<i>Paenibacillus</i>	2.75 × 10 <sup>6</sup>	<i>Paenibacillus</i>
													FSL R7-653	-	>40	<i>Bacillus</i>		
													FSL R7-654	-	>40	<i>Bacillus</i>		
G-4	14	42 (1)	530 (190)	FSL R7-679	-	18.37	<i>Paenibacillus</i>	FSL R7-695	-	>40	<i>Bacillus</i>	FSL R7-711	+	21.8	<i>Paenibacillus</i>	2.24 × 10 <sup>6</sup>	<i>Paenibacillus</i>	
				FSL R7-680	-	>40	<i>Bacillus</i>	FSL R7-696	-	>40	<i>Bacillus</i>	FSL R7-712	+/-	>40	<i>Bacillus</i>			
				FSL R7-681	-	>40	<i>Bacillus</i>	FSL R7-697	-	>40	<i>Bacillus</i>	FSL R7-713	-	>40	<i>Bacillus</i>			
				FSL R7-682	-	>40	<i>Bacillus</i>				FSL R7-714	-	>40	<i>Bacillus</i>				
Intermediate	C-5	117 (6)	87	550 (10)	FSL R7-722	-	>40	<i>Bacillus</i>	FSL R7-733	-	>40	<i>Bacillus</i>	FSL R7-736	-	>40	<i>Bacillus</i>	6.76 × 10 <sup>6</sup>	<i>Paenibacillus</i>
					FSL R7-723	-	>40	<i>Bacillus</i>	FSL R7-734	-	>40	<i>Bacillus</i>	FSL R7-737	-	>40	<i>Bacillus</i>		
					FSL R7-724	-	>40	<i>Bacillus</i>	FSL R7-735	-	>40	<i>Bacillus</i>	FSL R7-738	-	>40	<i>Bacillus</i>		
					FSL R7-725	-	>40	<i>Bacillus</i>				FSL R7-739	+/-	18.98	<i>Paenibacillus</i>			
					FSL R7-726	+	21.5	<i>Paenibacillus</i>										
	D-5	<1	3	<1	NA				FSL R7-740	-	>40	<i>Bacillus</i>	NA				3.55 × 10 <sup>6</sup>	<i>B. weihenstephanensis</i>
									FSL R7-741	-	>40	<i>Bacillus</i>						
									FSL R7-742	-	>40	<i>Bacillus</i>						
	J-5	<1	12	686	NA				FSL R7-744	-	>40	<i>Bacillus</i>	FSL R7-745	-	>40	<i>Bacillus</i>	1.95 × 10 <sup>6</sup>	<i>B. weihenstephanensis</i>
Low	J-4	10	15	9	FSL R7-685	-	>40	<i>Bacillus</i>	FSL R7-699	-	>40	<i>Bacillus</i>	FSL R7-716	-	>40	<i>Bacillus</i>	8.13 × 10 <sup>5</sup>	NA
					FSL R7-686	-	>40	<i>Bacillus</i>	FSL R7-700	-	>40	<i>Bacillus</i>	FSL R7-717	-	>40	<i>Bacillus</i>		
					FSL R7-687	-	>40	<i>Bacillus</i>	FSL R7-701	-	>40	<i>Bacillus</i>	FSL R7-718	-	>40	<i>Bacillus</i>		
	B-4	30	44	2410	FSL R7-671	-	>40	<i>Bacillus</i>	FSL R7-688	-	>40	<i>Bacillus</i>	FSL R7-702	-	>40	<i>Bacillus</i>	8.51 × 10 <sup>5</sup>	NA
					FSL R7-672	-	>40	<i>Bacillus</i>	FSL R7-689	-	>40	<i>Bacillus</i>	FSL R7-703	-	>40	<i>Bacillus</i>		
					FSL R7-673	-	>40	<i>Bacillus</i>										
	H-4	3	1	<1	FSL R7-683	-	>40	<i>Bacillus</i>	NA			NA				1.62 × 10 <sup>5</sup>	NA	
					FSL R7-684	-	>40	<i>Bacillus</i>										
	H-5	6	4	12 (5)	NA				FSL R7-746	-	>40	<i>Bacillus</i>	FSL R7-747	+/-	20.57	<i>Paenibacillus</i>	2.88 × 10 <sup>5</sup>	NA
													FSL R7-748	-	>40	<i>Bacillus</i>		
												FSL R7-749	-	>40	<i>Bacillus</i>			
J-3	6	5	937	FSL R7-637	-	>40	<i>Bacillus</i>	FSL R7-639	-	>40	<i>Bacillus</i>	FSL R7-642	-	>40	<i>Bacillus</i>	2.45 × 10 <sup>5</sup>	NA	
				FSL R7-638	-	>40	<i>Bacillus</i>	FSL R7-640	-	>40	<i>Bacillus</i>	FSL R7-643	-	>40	<i>Bacillus</i>			
A-4	3	2	3	FSL R7-662	-	>40	<i>Bacillus</i>	FSL R7-664	-	>40	<i>Bacillus</i>	FSL R7-666	-	>40	<i>Bacillus</i>	2.04 × 10 <sup>5</sup>	NA	
				FSL R7-663	-	>40	<i>Bacillus</i>	FSL R7-665	-	>40	<i>Bacillus</i>	FSL R7-667	-	>40	<i>Bacillus</i>			
E-5	1	<1	<1	FSL R7-743	-	>40	<i>Bacillus</i>	NA			NA				1.41 × 10 <sup>5</sup>	NA		
F-5	<1	29	1017	FSL R7-719	-	>40	<i>Brevibacillus</i>	FSL R7-720	-	>40	<i>Brevibacillus</i>	FSL R7-732	-	>40	<i>Bacillus</i>	1.41 × 10 <sup>5</sup>	NA	
E-3	1	1	<1	FSL R7-635	-	>40	<i>Oceanobacillus</i>	FSL R7-636	-	>40	<i>Bacillus</i>	NA				<1.00 × 10 <sup>5</sup>	NA	
F-3	<1	<1	577	NA				NA			FSL R7-657	-	>40	<i>Bacillus</i>	<1.00 × 10 <sup>5</sup>	NA		
H-3	2	<1	<1	FSL R7-659	-	>40	<i>Bacillus</i>	NA			NA					<1.00 × 10 <sup>5</sup>	NA	
				FSL R7-660	-	>40	<i>Bacillus</i>											
I-3	1	<1	<1	FSL R7-661	-	>40	<i>Bacillus</i>	NA			NA				<1.00 × 10 <sup>5</sup>	NA		
E-4	<1	2	<1	NA				FSL R7-694	-	>40	<i>Bacillus</i>	NA				<1.00 × 10 <sup>5</sup>	NA	
F-4	<1	1	16	FSL R7-668	-	>40	<i>Bacillus</i>	FSL R7-669	-	>40	<i>Bacillus</i>	FSL R7-670	-	>40	<i>Bacillus</i>	<1.00 × 10 <sup>5</sup>	NA	
I-4	<1	8	5700	NA				FSL R7-698	-	>40	<i>Bacillus</i>	FSL R7-715	-	>40	<i>Bacillus</i>	<1.00 × 10 <sup>5</sup>	NA	
I-5	4	<1	<1	FSL R7-750	-	>40	<i>Staphylococcus</i>	NA			NA				<1.00 × 10 <sup>5</sup>	NA		

<sup>a</sup>Growth category assigned based on APCs following heat shock and storage of milk at 6°C for 21 d. <sup>b</sup>High category indicates APC > 1 × 10<sup>6</sup> CFU/ml; <sup>c</sup>Intermediate category indicates APC ≤ 1 × 10<sup>6</sup> CFU/ml and > 2 × 10<sup>5</sup> CFU/ml; <sup>d</sup>Low category indicates APC ≤ 2 × 10<sup>5</sup> CFU/ml.

<sup>e</sup>β-gal positive (blue) colonies represented by "+"; β-gal negative colonies represented by "-"; and β-gal weakly positive colonies (partial blue or light blue) indicated by "+/-."

<sup>f</sup>Predominant spoilage bacteria not identified in milk samples where the bacterial count remained ≤ 2 × 10<sup>6</sup> CFU/ml or when no bacterial colonies could be isolated; indicated by NA.

<sup>g</sup>TaqMan C<sub>v</sub> values < 36.71 interpreted as a positive *Paenibacillus* colony.