Genome-Based Characterization of *Listeria monocytogenes*, Costa Rica

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Genomic data on the foodborne pathogen *Listeria monocytogenes* from Central America are scarce. We analyzed 92 isolates collected during 2009–2019 from different regions in Costa Rica, compared those to publicly available genomes, and identified unrecognized outbreaks. Our findings suggest mandatory reporting of listeriosis in Costa Rica would improve pathogen surveillance.

Listeria monocytogenes is a gram-positive pathogen infection that causes high hospitalization and mortality rates in at-risk populations, including older adults, immunocompromised persons, pregnant women, and newborns (1). L. monocytogenes diversity can be classified into lineages, genoserogroups, clonal complexes (CCs), and sequence types (STs), defined by multilocus sequence typing (MLST) (2). Core-genome MLST (cgMLST) further identifies sublineages (SLs) and cgMLST types (CTs) (2). Major CCs and SLs are distributed globally and can be heterogeneous in terms of virulence; isolates from serogroup IVb (lineage I) often cause the most severe infections (2–4).

Pathogen surveillance using whole-genome sequencing (WGS) provides unprecedented resolution for identifying case clusters and contamination sources and for predicting strain virulence and antimicrobial resistance, which can aid in risk assessment (2,5). Previous studies confirmed *L. monocytogenes* in various foods in Costa Rica; reported contamination levels were 5%–20% in processed meat products and fresh cheeses (6,7). Because listeriosis is not a notifiable disease in Costa Rica, its prevalence is unknown, and diversity of *L. monocytogenes* circulating in the country is unclear.

To clarify the diversity of and potential public health risk from circulating strains, we used WGS to characterize 92 isolates recovered during 2009–2019 from 16 clinical, 67 food, and 9 production environment samples in Costa Rica (Appendix, https:// wwwnc.cdc.gov/EID/article/29/12/23-0774-App1. pdf). When location data were available, isolates were from urban areas, including the capital city San José, and from rural areas where fresh cheese production is prevalent, including Alajuela, Naranjo, San Ramón, Vara Blanca, Upala, and Turrialba. Turrialba region accounts for 70% of fresh cheese produced in Costa Rica (Figure; Appendix).

We found that isolates from lineage I (95%, n = 88) and lineage II (5%, n = 4) were unevenly distributed into 12 different SLs and CCs (Figure; Appendix Figure 1). Those isolates included a new lineage I sublineage, designated SL1079 (new MLST singleton ST1079), which was identified in an isolate from shrimp (cgMLST type L1-SL1079-ST1079-CT1669). That isolate had an atypical genoserogroup IIb profile, designated IIb-v1, that differed from the classic IIb profile by the presence of *lmo0737*. WGS confirmed the presence of lmo0737 and flanking genes 1mo0733-39, typically found in lineage II isolates from serogroups IIa and IIc but only occasionally found in lineage I serogroup IVb-v1 (8). Of note, 80% of isolates investigated from both clinical and foodassociated sources were from sublineages SL2/CC2 (66%, n = 61) and SL3/CC3 (14%, n = 13). SL2/CC2 (serogroup IVb) and SL3/CC3 (serogroup IIb) isolates are found worldwide and are associated with invasive infections (2-4). However, they are rarely the most prevalent genotypes (2,3). Available data from other countries in Central America confirmed

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Figure. Single linkage dendrogram of 92 isolates generated for genome-based characterization of *Listeria monocytogenes*, Costa Rica. Dendrogram is based on core-genome multilocus sequence typing; (cgMLST) allelic profiles (1,748-locus scheme). Branches are colored according to lineages: L1, red; L2, blue. Branches are labeled according to lineages, sublineages, and clonal complexes. Information on isolates' serogroup, and resistance profiles are provided in the columns. Colors in location column correspond to dots on map. Gray bars indicate clusters of isolates with ≤7 allelic differences out of 1,748 cgMLST loci. Presence of selected virulence and resistance genetic traits in each isolate is represented by dark blue boxes and empty boxes denote genes with premature stop codons. More details are provided in Appendix Figure 1 (https://wwwnc.cdc.gov/EID/article/29/12/23-0774-App1.pdf). CC, clonal complex; L, lineage; LIPI, listeria pathogenicity island; SL, sublineage.

	5									
			1	lo. isolate	s (%)	_		Genetic		
			Total, n	Clinical,	Nonclinical,		Isolation	resistance		
cgMLST type	CC	Serogroup	= 92	n = 16	n = 76	Food type	years	traits		
L1-SL2-ST2-CT2715	CC2	IVb	8 (9)	4 (25)	4 (5)	Dairy, meat	2009, 2011,	bcrABC, qacA,		
							2013, 2016–	LGI-2		
							2017			
L1-SL2-ST2-CT6120	CC2	IVb	10 (11)	2 (13)	8 (9)	Dairy	2010, 2013,	qacA, LGI-2		
							2016, 2018–			
							2019			
L1-SL2-ST2-CT2718	CC2	IVb	5 (5)	1 (6)	4 (5)	Dairy	2016, 2019	qacA		
L1-SL2-ST1251-CT2780	CC2	IVb	3 (3)	1 (6)	2 (3)	Meat	2015–2016,	qacA		
							2018			
L1-SL3-ST3-CT2730	CC3	llb	9 (10)	0	9 (10)	Fish, meat	2016	bcrABC, SSI-1		
L1-SL2-ST2-CT6072	CC2	IVb	5 (5)	0	5 (7)	Dairy	2019	LGI-2		
L1-SL2-ST1627-CT6041	CC2	IVb	5 (5)	0	5 (7)	Dairy	2018–2019	LGI-2		
L1-SL87-ST847-CT65	CC87	llb	2 (2)	0	2 (3)	Meat	2016, 2019	NA		
L1-SL3-ST1262/ST2762-CT2781	CC3	llb	2 (2)	0	2 (3)	Dairy	2013	SSI-1		
L1-SL5-ST5-CT2793	CC5	llb	2 (2)	0	2 (3)	Fish, meat	2016	bcrABC, SSI-1		
L1-SL2-ST2-CT2762	CC2	IVb	2 (2)	0	2 (3)	Mushrooms	2011	LGI-2		
*Table includes types detected in this study comprising ≥2 isolates with a cutoff of 7 allelic differences, n = 11/48. CC, clonal complex; cgMLST, core-										
genome multilocus sequence typing; LC	GI, Listeri	a genomic isla	nd; NA, not	applicable;	SSI, stress surv	rival islet.				

Table. Sequence types identified in a genome-based characterization of Listeria monocytogenes, Costa Rica*

overrepresentation of SL2/CC2 and SL3/CC3 in Costa Rica (Appendix), which could be related to country's geographic location, climatic peculiarities, commercial trends, or natural reservoirs.

At the strain level, we identified 48 CTs, of which 44 (92%) were not previouly reported. Eleven (23%) CTs included multiple isolates at a cutoff of 7 allelic differences of 1,748 cgMLST loci (2) (Table; Figure; Appendix Figures 1–3). Eight isolates were cgMLST type L1-SL2-ST2-CT2715, which accounted for 25% of clinical cases and spanned 9 years (Table).

Most human cases were associated with dairy products (Table). However, tracing to confirm the source of infection was not possible because most production is conducted by local farmers, often without traceability or attribution to the site of production.

Fresh cheese production is an economic staple in Costa Rica, and previous studies have reported *L. monocytogenes* detection in those products (7). Results from this study also show detection of identical strains of cgMLST type L1-SL2-ST2-CT6072 along the same production line, from raw materials to the final product, suggesting inadequate sanitation contributes to contamination (9).

L. monocytogenes is problematic for the food industry because it can survive and multiply under adverse environmental conditions (10). In this study, 90% of isolates carried \geq 1 genetic element encoding for tolerance to disinfectants or stress. Markers of tolerance to disinfectants included *qacA* (51%, n = 47), *bcrABC* (23%, n = 21), and *emrC* (1%, n = 1). In addition, isolates had stress survival islet (SSI) genes, including SSI-1, conveying tolerance to low pH and high salt concentrations (21%, n =

19), and SSI-2 conveying, tolerance to high pH and oxidative stress (1%, n = 1), as well as *Listeria* genomic island (LGI) genes, including LGI-2 (50%, n = 48) and LGI-3 (1%, n = 1) conveying tolerance to metals. Those tolerances can make *L. monocytogenes* elimination from production sites more difficult.

This study provides insight into the diversity of *L. monocytogenes* strains circulating in Central America and can aid national reference institutions in promoting regulatory changes to guarantee mandatory listeriosis reporting. In addition, institutions should establish mechanisms to provide low-cost microbiologic analysis. We also recommend regular sampling of risk products and training of artisanal processors.

In conclusion, strengthened WGS surveillance in Costa Rica could assist in controlling *L. monocytogenes* and provide food producers with information on strain diversity and effective means of eradication. WGS surveillance also would enable authorities to detect outbreaks and trace sources of contamination.

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Human *Taenia martis* Neurocysticercosis, Switzerland

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Neurocysticercosis is almost exclusively caused by *Taenia solium* tapeworms. We describe a case of neurocysticercosis in Switzerland caused by infection with *Taenia martis*, the marten tapeworm, and review all 5 published cases of human infection with the marten tapeworm. In epidemiologically nonplausible cases of neurocysticercosis, zoonotic spillover infections should be suspected.

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Appendix

Materials and Methods

Bacterial Isolation

The study included 92 L. monocytogenes isolates previously collected from different regions throughout Costa Rica (Figure in main manuscript; Appendix Table 1) and spanning eleven years (2009–2019). Clinical isolates (n = 16) were obtained by the Institute for Research and Teaching in Nutrition and Health (INCIENSA) in the context of the activities of the Costa Rican National Clinical Laboratory Network, comprised by laboratories of major hospitals, clinical settings, and the University of Costa Rica (UCR). Even though L. monocytogenes is not a notifiable disease in the country, there is an established criterium where bacterial pathogens that cause meningitis are sent to INCIENSA for confirmation of identification as well as antibiotic susceptibility tests. Isolates from food and food-production environments (n = 76) were obtained by the National Laboratory of Veterinary Services (LANASEVE) of National Animal Health Service (SENASA), which performs microbiology analysis for the surveillance of food safety in products of animal origin for human consumption, by the INCIENSA that also monitors the microbiological quality of food for human consumption, and by the UCR and the Instituto Tecnológico de Costa Rica (ITCR) in the scope of research projects and/or routine analyses for customers, as well as in the framework of a specific study to investigate Listeria spp. strains previously isolated by private entities regulated and accredited by the international standard INTE/ISO/IEC 17025:2017 for microbiological analysis that guarantee the results of their sampling process.

Bacterial isolation was performed as described previously, following either the Bacteriological Analytical Manual method for *Listeria* isolation (1), for isolates obtained by the UCR, ITCR and SENASA, or the ISO 11290–1:2017 method (2), for isolates obtained by the INCIENSA.

Isolate identification was performed by proteomic analysis by matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry, using the MicroFlex LT system with MBT library DB-5989 (Bruker Daltonics, Bremen, Germany), as previously described (*3*).

DNA Extraction and Genome Sequencing

Isolates were cultured in Brain Heart Infusion Broth (BHI, Oxoid, Basingstoke UK) at 35°C overnight before use. DNA extraction was performed with the DNeasy Blood & Tissue Kit (QIAGEN, København Ø, Denmark-confirm), according to the instructions provided by the manufacturer. Qubit fluorometer (Thermo FisherScientific, Waltham, MA, USA) was used to evaluate DNA quantity and purity. Library preparation was performed with the Nextera XT DNA Sample Kit (Illumina, San Diego, CA, USA), and DNA sequencing was carried out on a NextSeq 500 platform (Illumina) using 2× 150-bp paired-end runs. Reads were trimmed using fqCleanER v.21.10 (https://gitlab.pasteur.fr/GIPhy/fqCleanER), and assemblies were obtained using SPAdes v.3.14.0 (4) and polished with Pilon v.1.23 (5).

In Silico Molecular Typing

PCR-serogroups (6), multilocus sequence types (MLST) (7), core genome MLST (cgMLST) (8), and virulence and resistance profiles (8-14) were extracted from draft assemblies using BIGSdb-*Lm* (8,15) and BLASTN algorithm, as described before (8).

Minimum spanning trees were obtained from MLST and cgMLST profiles using BioNumerics v.7.6 (Applied-Maths, Sint-Martens-Latem, Belgium). MLST analyses also included 351 publicly available *L. monocytogenes* profiles from neighboring countries, obtained from BIGSdb-*Lm* (http://bigsdb.pasteur.fr/listeria; accessed on 16 February 2023). cgMLSTbased dendrograms were built in BioNumerics v.7.6.3 (Applied Maths, Sint-Martens-Latem, Belgium) using categorical differences and the single-linkage clustering method, and visualyzed with iTOL v.5 (*16*).

Data Availability

Sequence data was made publicly available in NCBI/EBI/DDJJ databases (BioProject no. PRJEB20026).

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	No. bases													Clonal			
	after		No.	Total			% cgMLST	Source		Geographic	Isolation			complex,	Sublineage,	cgMLST	
Isolate no.	filtering	Coverage	contigs	length, bp	N50, bp	% GC	loci tagged	type	Sample type	location	year	Serogroup	Lineage	MLST	cgMLST	type	BIGSdb ID
CLIP 2017/00419	2.40E+08	83	38	3.01E+06	1.94E+05	37.8	99.7	F	Sausage	San José	2016	IVb	1	CC1	SL1	CT2786	ID102753
CLIP 2019/02752	3.82E+08	132	30	2.99E+06	2.62E+05	37.82	99.8	F	Cheese	Vara Blanca	2019	IVb	I	CC1	SL1	CT333	ID102785
CLIP 2019/02623	4.20E+08	145	43	3.04E+06	1.92E+05	37.8	99.9	Н	CSF	San José	2018	IVb	I	CC1	SL1	CT333	ID102774
CLIP 2019/02615	5.11E+08	176	38	3.02E+06	2.55E+05	37.81	99.9	F	Cheese	San José	2019	IVb	I	CC1	SL1	CT6042	ID102766
CLIP 2017/00404	3.05E+08	105	58	3.06E+06	1.43E+05	37.82	99.9	F	Cheese	ND	2011	IVb	I	CC2	SL2	CT2715	ID102739
CLIP 2017/00409	2.52E+08	87	110	3.05E+06	7.45E+04	37.85	99.3	F	Cheese	Cartago	2013	IVb	1	CC2	SL2	CT2715	ID102744
CLIP 2017/00417	5.93E+08	205	49	3.01E+06	1.39E+05	37.88	99.8	F	Sausage	San José	2016	IVb	1	CC2	SL2	CT2715	ID102751
CLIP 2019/02742	5.20E+08	179	47	3.17E+06	1.98E+05	37.7	99.8	F	Cheese	Upala	2017	IVb	1	CC2	SL2	CT2715	ID102775
CLIP 2017/00398	4.34E+08	150	58	3.17E+06	1.50E+05	37.69	99.8	Н	Blood	Guanacaste†	2013	IVb	1	CC2	SL2	CT2715	ID102733
CLIP 2017/00399	4.18E+08	144	51	3.16E+06	1.32E+05	37.69	99.8	н	Blood	Limónt	2013	IVb	1	CC2	SL2	CT2715	ID102734
CLIP 2017/00400	3.59E+08	124	40	3.10E+06	2.23E+05	37.75	99.8	H	Blood	Limón†	2013	IVb	i	CC2	SL2	CT2715	ID102735
CLIP 2017/00403	5 40E+08	186	52	3 17E+06	1 39E+05	37 69	99.8	Н	CSF	Herediat	2009	IVb	i	CC2	SI 2	CT2715	ID102738
CLIP 2017/00391	4.72E+08	163	51	3.04E+06	1.61E+05	37.84	99.9	H	Blood	Cartago†	2016	IVb	i	CC2	SL2	CT2716	ID102726
CLIP 2017/00405	4 46E+08	154	38	3.05E+06	1 39E+05	37.83	99.9	н	Blood	Limónt	2010	IVb	i	CC2	SI 2	CT2717	ID102740
CLIP 2019/02751	4 38E+08	151	34	3.06E+06	2 73E+05	37.84	99.9	F	Cheese	Vara Blanca	2019	IVb	i	CC2	SI 2	CT2718	ID102784
CLIP 2019/02753	3.36E+08	116	29	3.06E+06	2 72E+05	37.84	99.9	F	Cheese	San Ramón	2019	IVb	i	CC2	SL2	CT2718	ID102786
CLIP 2019/02754	3.03E+08	105	26	2 97E+06	3 33E+05	37.9	99.9	F	Cheese	San Ramón	2019	IVb	i	CC2	SL2	CT2718	ID102787
CLIP 2019/02756	2.54E+08	87	58	3.01E+06	1 44E+05	37.88	99.8	F	Cheese	Zarcero	2019	IVb	i	CC2	SL2	CT2718	ID102789
CLIP 2017/00396	5.98E+08	206	51	3.01E+06	1 41E+05	37.88	99.9	н	CSF	San José	2016	IVb	i	CC2	SL2	CT2718	ID102731
CLIP 2017/00407	4 45E+08	153	58	3.06E+06	1.52E+05	37.83	99.9	н	CSE	Cartagot	2010	IVb	i	CC2	SL2	CT2719	ID102742
CLIP 2017/00390	4.06E+08	140	42	3.04E+06	2 02E+05	37.81	99.9	н	CSF	Alaiuelat	2016	IVb	i	CC2	SL2	CT2720	ID102725
CLIP 2017/00392	5 23E+08	180	59	3.03E+06	1.52E+05	37.81	99.8	н	Blood	Alaiuela†	2013	IVb	i	CC2	SL2	CT2721	ID102727
CLIP 2017/00401	3 46E+08	119	38	2 96E+06	1.50E+05	37.85	99.8	F	Mushroom	ND	2010	IVb	i	CC2	SL2	CT2762	ID102736
CLIP 2017/00401	2 98E+08	103	42	2.00E+06	1.38E+05	37.81	90.0	F	Mushroom	ND	2011	IVb	i	002	SI 2	CT2762	ID102737
CLIP 2017/00402	2.00E+00	01	55	2.00E+00	1.87E+05	37.84	00.0	F	Chaosa	San losát	2011	IVb	i	CC2	SL 2	CT2770	ID102760
CLIP 2017/00420	1 59E+08	55	87	3.05E+06	9.85E+04	37.83	00.0 00 0	F	Sausade	San José	2016	IVb	i	CC2	SI 2	CT2780	ID102754
CLIP 2017/00420	2.61E+08	90	59	3.05E+06	1.53E+05	37.83	100	F	Sausage	San José	2010	IVb	i	CC2	SL 2	CT2780	ID102755
CLIP 2017/00421	2.01L+00	120	48	3.03E+00	2 38E+05	37.86	00 0	ч	Blood	San José	2013	IVb	i i	CC2	SL2	CT2780	ID102733
CLIP 2017/00/13	5.63E+08	10/	61	3.08E+06	1 20E+05	37 70	00.0	F	Cheese	San losát	2010	IVb	i	CC2	SI 2	CT2787	ID102777
CLIP 2010/02613	1.03E+08	1/1	41	3.00E+06	1.29L+05	37.86	00.0	F	Cheese	San José	2013	IVb	i i	CC2	SL2	CT6040	ID102747
CLIP 2019/02013	4.000-000	141	67	3.055+06	1.750+05	37.00	00.0		Choose	San José	2019	IVb	1	CC2	SL2	CT6040	ID102704
CLIP 2019/02010	4.27 E+08	147	62	3.05E+00	1.43E+05	37.86	99.9	F	Cheese	San José	2019	IVb	1	CC2	SL2	CT6041	ID102701
CLIP 2019/02012	3.790-00	117	65	3.055+06	1.010+05	37.00	00.8		Choose	San José	2019	IVb	1	CC2	SL2	CT6041	ID102703
CLIP 2019/02010	3.500+00	126	82	3.05E+00	1.110=+05	37.79	99.0		Choose	San José	2019	IVb	1	CC2	SL2	CT6041	ID102707
CLIF 2019/02010	3.03E+00	120	50	3.05E+00	1.100+05	27 70	99.9		Cheese	Turriolbo	2019	IVD IVb	1	CC2	SLZ	CT6041	10102709
CLIF 2019/02/30	4.94E+00	200	50	3.05E+00	1.900+03	27 01	99.9	Г	Blood	Son José	2010	IVD IVb	1	CC2	SLZ	CT6041	ID102703
CLIF 2019/02021	3.00E+00	200	76	3.00E+00	1.01E+05	37.04 27.0	99.9		Choose	San José	2010	IVD IVb	1	CC2	SLZ	CT6045	ID 102772
CLIP 2019/02011 CLIP 2010/02617	3.92E+00	100	/0 65	3.09E+00	1.90E+05	31.0 27 01	99.9		Cheese	San José	2019		1	CC2	SLZ SL2	CT6040	ID 102762
CLIF 2019/02017	3.000-00	122	05	3.03E+00	1.20E+03	37.04	99.9		Cheese	Jurrialha	2019	IVD IV/b	1	CC2	SLZ	CT6062	ID102700
CLIP 2019/02745	3.90E+00	100	30	2.97E+00	2.40E+05	37.91	99.9		Cheese	Turrialba	2010		1	CC2	SLZ	CT6065	ID102770
CLIP 2019/02740	4.02E+00	100	43	3.04E+00	2.7 IE+05	37.00	99.9		Cheese		2010		1	002	SLZ	C10005	ID102701
GLIP 2019/02/5/	3.04E+08	105	00	3.10E+06	2.39E+05	31.19	99.7		Cheese	San Islaro	2019		I	002	SL2	010000	10102790
GLIP 2019/02/44	4.94E+08	170	51	3.04E+06	2.38E+05	31.85	99.8		Cheese	Capellades	2018	IVD	I	002	SL2	C16067	ID102///
GLIP 2019/02/49	4.852+08	107	40	3.04E+06	1.596+05	31.85	99.9	F	Cheese	Santa Cruz	2018	IVD	1	002	SL2	C10069	ID102782
GLIP 2019/02/4/	4.08E+08	141	/4	3.U/E+U6	1.98E+05	31.83	99.9		Cneese	Turrialba	2018		I	002	SL2	C16070	ID102780
GLIP 2019/02/64	7.50E+U8	201	84 50	3.10E+00	3.21E+05	31.10	99.8	F	Raw milk	Turrialba	2019	IVD	1	002	SL2	0100/2	ID102/9/
GLIP 2019/02/05	1.01E+08	209	59	3.12E+06	2.00E+05	31.19	99.9	F	Cneese	i urrialba	2019	IVD	1	002	SL2	0100/2	10102798

Appendix Table 1. Isolate metadata and genome metrics of Listeria monocytogenes sequenced in this study (n = 92).

Intering Total Total Total Total Total Supplicable relation Complex supplicable Supplicable relation Complex supplicable Supplicable relation Supplicable relation </th <th></th> <th>No basos</th> <th></th> <th>Clonal</th> <th></th> <th></th> <th></th>		No basos													Clonal			
Instance Tearmin Dearmin <		NU. Dases		No	Total				Sourco		Coographia	lociation			Cional	Sublineage		
Dip Dip <thdip< th=""> <thdip< th=""> <thdip< th=""></thdip<></thdip<></thdip<>	looloto no	filtoring	Coverage	INU.	I Uldi	NEO ho	0/ CC		Source	Somple tune	Geographic	ISUIALIUT	Sorogroup	Linoago			cgiviLS i	
Lip 2 diff 2 diff 2 diff Lip 2 diff <thlip 2="" diff<="" th=""></thlip>			Coverage	contigs			% GC		туре	Sample type	Turrielles	year	Serogroup	Lineage			стре	
Lip 24190274 17.6E+08 248 62 3124-08 326E+08 37.47 99.9 PE Calling Limited 2019 IVb I CC2 SL2 CT6110 D102734 CLP 24170247 17.6E+08 641 90 3.12E+08 3.5E+08 37.8F 99.9 FE Cheese Heredia 2013 IVb I CC2 SL2 CT6110 D102734 CLP 24170247 5.36E+08 129 37 316E+08 3.5E+05 37.8F 99.9 FE Cheese Heredia 2013 IVb I CC2 SL2 CT6110 D102749 CLP 24170247 277E+08 95 75 00E+05 37.8F 99.9 FE Cheese Heredia 2013 IVb I CC2 SL2 CT6110 D102749 CLP 24170247 277E+08 95 75 00E+05 37.8F 99.9 FE Cheese Heredia 2013 IVb I CC2 SL2 CT6120 D102749 CLP 24170247 277E+08 95 75 00E+05 37.8F 99.9 FE Cheese Catagor 2013 IVb I CC2 SL2 CT6120 D102749 CLP 24170447 277E+08 95 51 30E+05 37.8F 99.9 FE Cheese Catagor 2013 IVb I CC2 SL2 CT6120 D102749 CLP 24170447 277E+08 90 65 73 00E+06 2.3F 99.9 FE Cheese Catagor 2013 IVb I CC2 SL2 CT6120 D102749 CLP 24170474 277E+08 90 65 31 30E+05 37.8F 99.9 FE Cheese Catagor 2013 IVb I CC2 SL2 CT6120 D102749 CLP 241707047 276E+08 90 68 33.8E+05 37.8F 99.9 FE Cheese Catagor 2013 IVb I CC2 SL2 CT6120 D102749 CLP 24190276 345E+08 90 68 33.8E+05 37.8F 99.9 FE Cheese San 30c2 2013 IVb I CC2 SL2 CT6120 D102749 CLP 24190276 36E+08 236 473 327E+06 33.6F 93.8F FC Cheese Taraba 2019 IVb I CC2 SL2 CT6120 D102749 CLP 24190276 86E+08 236 473 327E+06 33.6F 93.8F FC Cheese Taraba 2019 IVb I CC2 SL2 CT6120 D102749 CLP 24190276 86E+08 236 473 327E+06 33.6F 93.8F FC Cheese Taraba 2019 IVb I CC2 SL2 CT6120 D102749 CLP 24190276 86E+08 236 4473 327E+06 3.6E+05 37.87 99.9 FF Cheese Taraba 2019 IVb I CC2 SL2 CT6120 D102749 CLP 24190276 86E+08 236 4473 33.6F+06 37.87 99.9 FF Cheese Taraba 2019 IVb I CC2 SL2 CT6120 D102749 CLP 24190276 86E+08 236 4473 327E+06 3.6E+05 37.87 99.9 F Mear ND 2016 IVb I CC2 SL2 CT6120 D102749 CLP 24170238 3.4F+06 148 43 3.0E+06 37.87 99.9 F Cheese Namba 2019 IVb I CC2 SL2 CT6120 D102749 CLP 24170388 3.4F+08 148 43 3.0E+06 37.87 99.9 FF Cheese Namba 2016 IVb I CC2 SL2 CT6120 D102749 CLP 24170388 3.4F+08 148 43 3.0E+06 37.87 99.9 FF Cheese Namba 2016 IVb I CC2 SL2 CT6120 D102749 CLP 24170388 3.4F+0	CLIP 2019/02759	1.24E+09	420	120	3.11E+06	3.60E+05	38	99.9	PE	Drain		2019			002	SLZ	016072	ID102792
Culp 20170071 Culp 20170074 Culp 2017074 Culp 2017074 <td>CLIP 2019/02760</td> <td>7.47E+08</td> <td>258</td> <td>47</td> <td>3.12E+06</td> <td>3.60E+05</td> <td>31.11</td> <td>99.9</td> <td>PE</td> <td>Тапк</td> <td></td> <td>2019</td> <td>IVD</td> <td>!</td> <td>002</td> <td>SL2</td> <td>C16072</td> <td>ID102793</td>	CLIP 2019/02760	7.47E+08	258	47	3.12E+06	3.60E+05	31.11	99.9	PE	Тапк		2019	IVD	!	002	SL2	C16072	ID102793
cl/p 201700272 178-108 cl/p 201700275 3.08-108 c) 5.82-0 CT0117 D102728 CL/P 201700275 3.08-108 128 3.07 3.08-108 3.08-108 3.08-108 3.08-108 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02788 2.010 10.02786 2.010 10.02748 2.010	CLIP 2019/02/61	7.06E+08	243	62	3.15E+06	3.63E+05	37.81	99.9	PE	Cooling	lurrialba	2019	IVD	I	002	SL2	C16072	ID102794
CLP 2477/04372 1.76±+08 61 90 3.12±+08 95.8±+04 3.769 99.8 PC Solid Cartagor 2015 M/b I CC2 SL2 CT6117 D1102778 CLP 2017/0412 2.08±+08 7.2 60 3.08±+06 1.38±+06 3.78 98.8 F Chease Cartagor 2013 M/b I CC2 SL2 CT6117 D1102748 CLP 2017/0412 2.08±+08 7.8 98.8 F Chease Cartagor 2013 M/b I CC2 SL2 CT6120 D1102745 CLP 2017/0415 2.78±+08 96 51 3.08±+00 1.58±+05 37.8 99.9 F Chease Cartagor 2013 M/b I CC2 SL2 CT6120 D102745 CLP 2017/0423 2.06±+08 90 63 3.08±+00 3.08±+00 3.78 99.9 F Chease Saralos 2013 M/b I CC2 SL2 CT6120 D102776 CLP 2017/0423 2.06±+08 3.08±+06 3.08±+06 3.08										chamber	.							
CLP 201700242 5384=08 191 32 304E+06 19E+05 37.81 99.9 F Cheese Heradia 2013 Nb I CC2 SL2 CT6117 ID102785 ID102785 36E+08 7.3 85E+08 7.7 898.9 F Cheese Cartago 2013 Nb I CC2 SL2 CT612 ID102745 ID102745 CLP 20170041 277E+08 96 61 30.4E+06 15E+05 37.8 99.9 F Cheese Cartago 2013 Nb I CC2 SL2 CT612 ID102745 ID102745 24E+08 96 61 30.4E+06 15E+05 37.8 99.9 F Cheese Cartago 2013 Nb I CC2 SL2 CT612 ID102745 ID102785 ID102785 24E+08 94 48 30.4E+06 15E+05 37.8 99.9 F Cheese Cartago 2013 Nb I CC2 SL2 CT6120 ID102775 ID102745 ID102785 24E+08 94 48 30.4E+06 15E+05 37.84 99.9 F Cheese Cartago 2013 Nb I CC2 SL2 CT6120 ID102775 (LP 20170044 2.4E+08 94 48 30.4E+06 15E+05 37.84 99.9 F Cheese San.0s6 2013 Nb I CC2 SL2 CT6120 ID102775 (LP 201902614 2.45E+08 30.8E+06 13.8E+05 37.81 99.4 F Cheese San.0s6 2019 Nb I CC2 SL2 CT6120 ID102775 (LP 201902614 2.45E+08 14 55 30.8E+06 13.8E+05 37.81 99.4 F Cheese San.0s6 2019 Nb I CC2 SL2 CT6120 ID102775 (LP 201902614 2.45E+08 145 59 30.8E+06 13.8E+05 37.81 99.9 H Cheese San.0s6 2019 Nb I CC2 SL2 CT6120 ID102775 ID102775 8 86E+08 147 53 30E+06 13.8E+05 37.81 99.9 H CSF Cartago 2016 Nb I CC2 SL2 CT6120 ID102775 ID102775 8 86E+08 147 53 30E+06 13.8E+05 37.81 99.9 H CSF Cartago 2016 Nb I CC2 SL2 CT6120 ID102775 ID102775 8 86E+08 147 53 30E+06 13.8E+05 37.81 99.9 H CSF Cartago 2016 Nb I CC2 SL2 CT6120 ID102725 ID102775 8 86E+08 148 41 3.0E+06 3.78.1 99.9 F Meat ND 2016 Nb I CC2 SL2 CT6120 ID102725 ID102774 ID102725 8 86E+08 148 41 3.0E+06 3.78.1 99.9 F Meat ND 2016 Nb I CC2 SL2 CT6120 ID102725 ID102774 ID102725 8 82E+08 148 41 3.0E+06 3.78.1 99.9 F Cheese Nama 2016 Nb I CC2 SL2 CT6120 ID102725 ID102774 ID102725 8 82E+08 138 44 3.0E+06 3.8E+08 37.8 99.9 F Neat ND 2016 Nb I CC2 SL2 CT6120 ID102725 ID102774 ID10273 ID102705 3.32E+08 118 41 3.0E+06 3.78.1 99.8 F Cheese Nama 2016 Nb I CC2 SL2 CT6120 ID102724 ID102774 ID10277	CLIP 2017/00372	1.76E+08	61	90	3.12E+06	9.53E+04	37.69	99.9	PE	Soil	Cartago†	2016	IVb	I	CC2	SL2	CT6116	ID102721
CLP 291902755 368E-08 126 37 304E-06 358E-08 37.84 99.9 F Cheese Zarcero 2019 Wb I CC2 SL2 CT6118 UD102748 UD102748 UD12749 CLP 20170045 276E-08 96 4 48 51 304E-06 158E-08 37.84 99.9 F Cheese Cartago 2013 Wb I CC2 SL2 CT6120 UD102749 UD12749 CLP 20170042 276E-08 96 4 48 30.4E-06 158E-08 37.84 99.9 F Cheese Cartago 2013 Wb I CC2 SL2 CT6120 UD102775 (CLP 20170042 276E-08 96 4 48 30.4E-06 33.86E-06 33.86E-	CLIP 2017/00424	5.53E+08	191	32	3.04E+06	1.98E+05	37.81	99.9	F	Cheese	Heredia	2013	IVb		CC2	SL2	CT6117	ID102758
CLIP 2017/00412 206E+08 72 60 3.06E+06 1.35E+05 37.8 99.8 F Cheese Catago 2013 IVb I CC2 SL2 CT6191 [D102745 CLIP 2017/0045 2.76E+08 96 C5 3.06E+06	CLIP 2019/02755	3.66E+08	126	37	3.04E+06	3.55E+05	37.84	99.9	F	Cheese	Zarcero	2019	IVb	I	CC2	SL2	CT6118	ID102788
CLIP 2017/0041 2.77E+08 96 51 3.04E+06 1.55E+05 37.8 99.8 F Cheese Cartago 2013 IVb I CC2 SL2 CT6120 ID102749 CLIP 2017/0041 2.74E+08 94 44 3.04E+06 1.55E+05 37.84 99.9 F Cheese San José 2013 IVb I CC2 SL2 CT6120 ID102752 DLIP 2017/0042 2.45E+08 94 44 3.04E+06 1.50E+05 37.84 99.9 F Cheese San José 2013 IVb I CC2 SL2 CT6120 ID102752 DLIP 2017/0041 2.45E+08 94 46 3.04E+06 1.50E+05 37.84 99.9 F Cheese San José 2013 IVb I CC2 SL2 CT6120 ID102752 DLIP 2017/00476 3.45E+08 119 59 3.04E+06 1.50E+05 37.81 99.4 F Cheese Turniaba 2019 IVb I CC2 SL2 CT6120 ID102755 DLIP 2019/02763 9.18E+08 317 136 3.12E+06 3.58E+05 367 99.9 F Cheese Turniaba 2019 IVb I CC2 SL2 CT6120 ID102756 DLIP 2019/02763 9.18E+08 317 136 3.12E+06 3.58E+05 367 99.9 F Cheese Turniaba 2019 IVb I CC2 SL2 CT6120 ID102765 DLIP 2019/02763 9.18E+08 317 136 3.12E+06 3.58E+05 37.81 99.9 H Blood Cartago 2016 IVb I CC2 SL2 CT6120 ID102766 DLIP 2019/02763 9.18E+08 317 136 3.15E+05 37.81 99.9 H Blood Cartago 2016 IVb I CC2 SL2 CT6120 ID102766 DLIP 2019/0378 4.47E+08 118 41 3.05E+06 1.38E+05 37.81 99.9 H CSF Cartago 2010 IVb I CC2 SL2 CT6120 ID102764 DLIP 2017/0388 3.42E+08 118 41 3.05E+06 1.38E+05 37.81 99.9 H CSF Cartago 2010 IVb I CC2 SL2 CT6120 ID10274 DLIP 2017/0388 3.42E+08 118 41 3.05E+06 1.58E+05 37.81 99.9 F Shimp San José 2016 IVb I CC2 SL2 CT6120 ID10274 DLIP 2017/0388 3.42E+08 118 41 3.05E+06 1.58E+05 37.81 99.9 F Shimp San José 2016 IVb I CC2 SL2 CT6120 ID10274 DLIP 2017/0388 3.22E+08 118 59 3.03E+06 1.58E+05 37.81 99.9 F Shimp San José 2016 IIb I CC3 SL3 CT1674 ID10274 DLIP 2017/0388 3.22E+08 118 59 3.03E+06 1.58E+05 37.81 99.9 F Chicken San José 2016 IIb I CC3 SL3 CT1672 ID102724 DLIP 2017/0386 3.25E+08 116 51 3.14E+05 37.81 99.8 F Chicken San José 2016 IIb I CC3 SL3 CT1270 ID102710 DLIP 2017/0386 3.25E+08 116 51 3.05E+05 37.81 99.9 F Chicken San José 2016 IIb I CC3 SL3 CT2730 ID102710 DLIP 2017/0386 3.25E+08 133 444 3.30E+06 1.58E+05 37.81 99.8 F Chicken San José 2016 IIb I CC3 SL3 CT2730 ID102710 DLIP 2017/0386 3.25E+08 133 444 3.30E+06 1.58E+05 37.8	CLIP 2017/00412	2.08E+08	72	60	3.06E+06	1.35E+05	37.8	99.8	F	Cheese	Cartago	2013	IVb	I	CC2	SL2	CT6119	ID102746
CLIP 2017/00415 2.78E+08 96 51 3.04E+06 1.58E+05 3.7.84 99.9 F Cheese Cartago 2013 IVb I CC2 SL2 CT6120 ID102752 CLIP 2017/00423 2.62E+08 90 63 3.08E+06 1.36E+05 3.7.8 99.9 F Cheese Cartago 2013 IVb I CC2 SL2 CT6120 ID102752 CLIP 2017/00424 2.43E+08 118 57 3.08E+06 1.81E+05 3.7.8 99.9 F Cheese San Jose 2013 IVb I CC2 SL2 CT6120 ID102755 CLIP 2017/00423 2.63E+08 118 57 3.08E+06 1.81E+06 3.7.8 99.9 F Cheese San Jose 2013 IVb I CC2 SL2 CT6120 ID102755 CLIP 2017/00423 3.64E+06 1.8 57 3.08E+06 1.81E+06 3.7.8 99.9 F Cheese Turnaba 2018 IVb I CC2 SL2 CT6120 ID102755 CLIP 2017/00433 4.7E+08 144 59 3.08E+06 3.08E+06 3.7.8 99.9 H Cheese Turnaba 2019 IVb I CC2 SL2 CT6120 ID102765 CLIP 2017/00438 4.09E+08 144 69 3.08E+06 3.7.8 99.9 H CSF Cartagor 2016 IVb I CC2 SL2 CT6120 ID102745 CLIP 2017/00468 4.09E+08 144 69 3.08E+06 3.7.8 99.9 H CSF Cartagor 2016 IVb I CC2 SL2 CT6120 ID102743 CLIP 2017/00468 4.09E+08 144 59 3.08E+06 3.7.8 99.9 F Met ND 2016 IVb I CC2 SL2 CT6120 ID102743 CLIP 2017/00468 4.09E+08 148 4.3 0.5E+06 4.3.8E+05 3.7.9 99.9 F Met ND 2016 IVb I CC2 SL2 CT6121 ID102744 CLIP 2017/00485 3.03E+08 118 41 3.05E+06 4.3.8E+05 3.7.9 99.9 F Met ND 2016 IVb I CC2 SL2 CT6122 ID102743 CLIP 2017/00488 3.2E+08 118 4.1 3.05E+06 4.3.8E+05 3.7.9 99.9 F Met ND 2016 IVb I CC2 SL2 CT6122 ID102744 CLIP 2017/00383 3.2E+08 118 41 3.05E+06 4.3.8E+05 3.7.8 99.9 F Suasage ND 2016 IVb I CC3 SL3 CT6124 ID102744 CLIP 2017/00383 3.2E+08 118 4.1 3.05E+06 4.3.8E+05 3.7.8 99.9 F Suasage ND 2016 IVb I CC3 SL3 CT6124 ID102744 CLIP 2017/00383 3.2E+08 113 59 3.03E+06 1.8E+05 3.7.8 99.8 F Granube/San Jose 2016 IIb I CC3 SL3 CT6164 ID102742 CLIP 2017/00383 3.2E+08 113 59 3.03E+06 1.8E+05 3.7.8 99.8 F Coheese San Jose 2016 IIb I CC3 SL3 CT6270 ID102744 CLIP 2017/00383 3.2E+08 114 4.3 0.0E+06 1.8E+05 3.7.8 99.8 F Cohees San Jose 2016 IIb I CC3 SL3 CT6270 ID102744 CLIP 2017/00383 3.2E+08 114 4.3 0.0E+06 1.8E+05 3.7.8 99.8 F Cohees San Jose 2016 IIb I CC3 SL3 CT6270 ID102747 CLIP 2017/00383 3.2E+08 13 5.4 0.5.4E+05 3.7.8 99.8 F Cohees San Jose 2016 IIb I	CLIP 2017/00411	2.77E+08	96	57	3.08E+06	2.81E+05	37.8	99.8	F	Cheese	Cartago	2013	IVb	I	CC2	SL2	CT6120	ID102745
CLIP 2017/00418 2.74E+08 94 48 3.04E+08 1.50E+05 3.7.8 99.9 F Cheese San José 2013 IVb I CC2 SL2 CT6120 ID102757 CLIP 20190274 2.45E+08 84 90 3.08E+06 9.0E+04 3.7.8 99.4 F Cheese San José 2019 IVb I CC2 SL2 CT6120 ID102757 CLIP 20190274 2.45E+08 84 90 3.08E+06 9.0E+04 3.7.8 99.4 F Cheese San José 2019 IVb I CC2 SL2 CT6120 ID102757 CLIP 20190276 6.8E+08 246 475 3.27E+06 2.78E+05 38.67 99.9 F Cheese Turialba 2019 IVb I CC2 SL2 CT6120 ID102756 CLIP 20190276 6.8E+08 246 475 3.27E+06 1.5E+05 3.7.7 99.9 F R Rw Mik Turialba 2019 IVb I CC2 SL2 CT6120 ID102756 CLIP 20190276 6.8E+08 246 475 3.27E+06 1.5E+05 3.7.7 99.9 F R Rw Mik Turialba 2019 IVb I CC2 SL2 CT6120 ID102756 CLIP 20190276 6.8E+08 246 475 3.27E+06 1.5E+05 3.7.7 98.9 H CC2 Carapot 2016 IVb I CC2 SL2 CT6120 ID102746 CLIP 20190276 4.8E+06 144 59 3.08E+06 1.5E+05 3.7.7 98.9 H CC2 Carapot 2016 IVb I CC2 SL2 CT6120 ID102741 CLIP 20190276 8.2E+08 144 41 3.06E+06 1.38E+05 3.7.8 99.9 F Cheese Naranjo 2019 IVb I CC2 SL2 CT6121 ID102741 CLIP 20190276 3.2E+08 148 41 3.06E+06 1.38E+05 3.7.8 99.9 F Cheese Naranjo 2019 IVb I CC2 SL2 CT6121 ID102741 CLIP 20170038 3.32E+08 113 59 3.03E+06 1.5E+05 3.7.8 99.9 F Shimp San José 2016 IVb I CC2 SL2 CT6121 ID102741 CLIP 20170038 3.22E+08 113 59 3.03E+06 1.5E+05 3.7.8 99.9 F Shimp San José 2016 IVb I CC3 SL3 CT1674 ID10272 CLIP 20170038 3.22E+08 113 59 3.03E+06 1.5E+05 3.7.8 99.8 F Cheese Naranjo 2019 IVb I CC3 SL3 CT1674 ID10272 CLIP 20170038 3.22E+08 12 4 3.05E+06 1.3E+05 3.7.8 99.8 F Cheese Naranjo 2016 IVb I CC3 SL3 CT1674 ID10272 CLIP 20170038 3.22E+08 12 4 3.05E+06 1.3E+05 3.7.8 99.8 F Cheese Naranjo 2016 IVb I CC3 SL3 CT1674 ID10272 CLIP 20170038 3.22E+08 12 4 3.05E+06 1.3E+05 3.7.8 99.8 F Cheese Naranjo 2016 IVb I CC3 SL3 CT1674 ID10272 CLIP 20170038 3.22E+08 12 4 3.05E+06 1.3E+05 3.7.8 99.8 F Pork Heredia 2016 IIb I CC3 SL3 CT1674 ID10272 CLIP 20170038 3.22E+08 12 4 3.05E+06 1.3E+05 3.7.8 99.8 F Pork Heredia 2016 IIb I CC3 SL3 CT1674 ID10274 CLIP 20170038 4.2E+06 139 51 3.05E+06 1.3E+05 3.7.8 99.8 F Cheese San José 2016 IIb	CLIP 2017/00415	2.78E+08	96	51	3.04E+06	1.55E+05	37.84	99.9	F	Cheese	Cartago†	2013	IVb	I	CC2	SL2	CT6120	ID102749
CLIP 2017/00423 2 62±708 90 63 3 08E+06 1 38E+05 37.8 99.9 F Cheese San José 2013 IVb I CC2 SL2 CT6120 [D102775] CLIP 201902746 3 43E+08 119 59 3 08E+06 1 61±-05 37.81 99.8 F Cheese Turnialba 2018 Nb I CC2 SL2 CT6120 [D1027779] CLIP 201902763 8 84±-08 317 138 31.2E+00 3.86E+08 38.0 98.9 F Cheese Turnialba 2019 Nb I CC2 SL2 CT6120 [D102778] CLIP 201700406 6.38+08 23.8 47.8 39.9 F Rew milk Turnialba 2019 Nb I CC2 SL2 CT6120 [D102778] CLIP 2017003046 4.08E+04 31.85+06 37.81 99.9 F Mea<	CLIP 2017/00418	2.74E+08	94	48	3.04E+06	1.50E+05	37.84	99.9	F	Cheese	San José	2013	IVb	I	CC2	SL2	CT6120	ID102752
CLIP 2019/02/64 2.43E+08 94 90 3.08E+06 9.08E+04 37.81 99.4 F Cheese Turniaba 2019 N/b I CC2 SL2 CT6120 ID102776 CLIP 2019/02762 6.86E+08 238 475 3.27E+06 2.73E+05 39.67 99.8 F Cheese Turniaba 2019 N/b I CC2 SL2 CT6120 ID102776 CLIP 2019/02763 9.18E+08 137 136 3.12E+06 3.56E+05 30.7 99.9 F Rewink Turniaba 2019 N/b I CC2 SL2 CT6120 ID102778 CLIP 2017/00393 4.76E+08 164 59 3.08E+06 1.36E+05 37.8 99.9 H CSF Cartagot 2016 N/b I CC2 SL2 CT6120 ID102728 CLIP 2017/0046 6.38E+08 228 60 3.07E+08 1.38E+05 37.81 99.9 H CSF Cartagot 2016 N/b I CC2 SL2 CT6120 ID102728 CLIP 2017/0045 6.38E+08 141 66 3.08E+06 3.78E 99.9 H CSF Cartagot 2016 N/b I CC2 SL2 CT6120 ID102748 CLIP 2017/0045 6.38E+08 228 60 3.07E+08 1.38E+05 37.78 99.9 H CSF Cartagot 2016 N/b I CC2 SL2 CT6120 ID102741 CLIP 2017/0036 3.38E+04 113 441 3.06E+06 1.38E+05 37.78 99.9 F New N/b 2016 N/b I CC2 SL2 CT6120 ID102741 CLIP 2017/0037 3.37E+08 113 59 3.03E+06 1.58E+05 37.78 99.9 F Shinep San Josét 2016 N/b I CC3 SL3 CT7276 ID102720 CLIP 2017/0037 3.37E+08 113 59 3.03E+06 1.58E+05 37.79 99.9 F Shinep San Josét 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/0037 3.37E+08 110 53 3.14E+06 1.98E+05 37.81 99.8 F Chicken San José 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/0038 3.28E+08 82 45 3.05E+06 1.38E+05 37.81 99.8 F Chicken San José 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/00370 3.37E+08 110 53 3.14E+06 1.98E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/0038 3.28E+08 82 45 3.05E+06 1.38E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT1730 ID102711 CLIP 2017/0038 3.05E+08 127 43 3.05E+06 1.38E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT1730 ID102711 CLIP 2017/0038 3.05E+08 127 44 3.05E+06 1.38E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT1730 ID102711 CLIP 2017/0038 4.02E+08 139 51 3.05E+06 1.37E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT2730 ID102711 CLIP 2017/0038 3.05E+08 171 44 3.05E+06 1.37E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT2730 ID102711 CLIP 2017/0038 3.05E+08 173	CLIP 2017/00423	2.62E+08	90	63	3.08E+06	1.39E+05	37.8	99.9	F	Cheese	Cartago	2013	IVb	I	CC2	SL2	CT6120	ID102757
CLIP 201902746 3.45E+08 119 59 3.08E+06 1.61E+05 37.81 99.8 F Cheese Turniaba 2018 IVb I CC2 SL2 CT6120 [D102779 CLIP 201902753 9.18E+08 317 136 3.12E+06 3.38E+05 3.08E+06 3.38E+05 3.08E+06 3.38E+06 3.08E+06 3.38E+06 3.08E+06 3.38E+06 1.36E+05 37.8 99.9 H Blood Cartagort 2016 IVb I CC2 SL2 CT6120 [D102743 CLIP 201700408 4.09E+08 141 66 3.08E+06 1.38E+05 37.81 99.9 H CSF Cartagort 2016 IVb I CC2 SL2 CT6120 [D102774] CLIP 201700389 3.48E+08 118 41 3.08E+06 77.9 99.9 F Shausage ND 2016 IVb I CC2 SL2 CT6120 [D102774] CLIP 2017/00338 3.32F+06 13.48 53 3.14E+06 13.8E+05 37.75 99.9 F Shausage	CLIP 2019/02614	2.43E+08	84	90	3.08E+06	9.05E+04	37.81	99.4	F	Cheese	San José	2019	IVb	I	CC2	SL2	CT6120	ID102765
CLIP 2019/02752 6.86E+08 256 475 3.27E+06 3.27E+06 3.86T+09 9.8 F Cheese Turniaba 2019 IVb I CC2 S.L2 CT6120 [D102795 CLIP 2017/0033 4.76E+08 164 59 3.08E+06 3.58E+05 37.81 99.9 H Blood Cartagot 2016 IVb I CC2 S.L2 CT6120 ID102728 CLIP 2017/0046 6.63E+08 2.88 60 3.07E+06 1.38E+05 37.83 99.9 F Meat ND 2015 IVb I CC2 S.L2 CT6120 ID1027741 CLIP 2017/0383 3.32E+06 1.38E+05 3.7.9 99.9 F Cheese Naranjo 2019 IVb I CC2 S.L2 CT6120 ID102724 CLIP 2017/0338 3.27E+06 114 3.04E+06 1.38E+05 37.79 99.9 F Shuage ND 2016 IIb+1 I CC23 S.L3	CLIP 2019/02746	3.45E+08	119	59	3.08E+06	1.61E+05	37.81	99.8	F	Cheese	Turrialba	2018	IVb	1	CC2	SL2	CT6120	ID102779
CLP 201002763 9.18E+06 3.12E+06 3.58E+06 3.807 99.9 H Raw milk Turniaba 2016 IVb I CC22 SL2 CT6120 D102736 CLIP 201700348 4.08E+06 13.4E+06 1.36E+05 3.781 99.9 H CSF Cartagot 2016 IVb I CC22 SL2 CT6120 D102736 CLIP 201700466 6.63E+06 1.38E+06 3.779 99.9 H CSF Cartagot 2016 IVb I CC22 SL2 CT6120 D102734 CLIP 201700378 8.26E+06 128E+06 3.378+08 99.8 F Cheese Narajo 2016 IVb <i< td=""> CC21 SL2 CT6120 D102736 CLIP 201700383 3.27E+08 116 53 3.05E+05 3.778 99.9 F Sausege ND 2016 IIb<i< td=""> CC23 SL3 CT1649 D102726 CLIP 201700383 3.27E+08 116 53 3.14E+06</i<></i<>	CLIP 2019/02762	6.86E+08	236	475	3.27E+06	2.73E+05	39.67	99.8	F	Cheese	Turrialba	2019	IVb	1	CC2	SL2	CT6120	ID102795
CLIP 2017/00393 4.78E+08 164 59 3.08E+06 1.50E+05 37.8 99.9 H Corr Cartagor 2016 IVb I CC2 S.L2 CT6120 D102728 CLIP 2017/00406 6.63E+08 128 60 3.07E+06 3.7.9 99.9 H CSF Cartagor 2015 IVb I CC2 S.L2 CT6121 D102723 CLIP 2017/00369 3.08E+06 13.8E+06 3.7.91 99.9 F Mean ND Q16 IVb I CC2 S.L2 CT6122 D102724 CLIP 2017/00380 3.02E+06 13.8E+06 3.7.8 99.9 F Sausago ND I CC217 S.L217 CT222 D102726 CLIP 2017/00380 3.02E+06 13.6E+06 3.7.8 99.9 F Sausago ND I CC217 S.L217 CT0222 D102726 CLIP 2017/00380 3.02E+06 1.4E+06 5.7.7.9 99.8 F Chicken<	CLIP 2019/02763	9 18F+08	317	136	3 12E+06	3 58E+05	38 07	99.9	F	Raw milk	Turrialba	2019	IVb	1	CC2	SI 2	CT6120	ID102796
CLIP 2017/0408 4 09E+08 141 66 3 08E+06 1 38E+05 37 81 99.9 H CSF Cartagort 2010 IVb I CC2 SL2 CT6120 D102743 CLIP 2017/0408 4 343E+08 118 41 3 05E+06 1.38E+05 37.83 99.9 F Meat ND D106 Ivb I CC2 SL2 CT6122 D102724 CLIP 2017/0328 3.38E+08 118 41 3.05E+06 1.38E+05 37.91 99.9 F Cheese Namp 2016 Ivb I CC2 SL2 CT6122 D102724 CLIP 2017/0335 3.37E+08 116 53 3.4E+06 3.75 99.9 F Shump Sausage ND 2016 Ilb I CC3 SL3 CT1674 D102707 CLIP 2017/0356 3.37E+08 116 53 3.4E+06 37.81 99.8 F Oricken Sausage 2016 Ilb I CC3 SL3 CT1674 D102707 CLIP 2017/0358 2.38E+08 82 </td <td>CLIP 2017/00393</td> <td>4 76E+08</td> <td>164</td> <td>59</td> <td>3 08E+06</td> <td>1 50E+05</td> <td>37.8</td> <td>99.9</td> <td>Ĥ</td> <td>Blood</td> <td>Cartagot</td> <td>2016</td> <td>IVb</td> <td>i</td> <td>CC2</td> <td>SI 2</td> <td>CT6120</td> <td>ID102728</td>	CLIP 2017/00393	4 76E+08	164	59	3 08E+06	1 50E+05	37.8	99.9	Ĥ	Blood	Cartagot	2016	IVb	i	CC2	SI 2	CT6120	ID102728
CLP 2017/00406 6.83E+08 2.28 60 3.07E+06 1.38E+05 37.75 69.69 H CSF Cartagot 2015 I/b I CC2 SL2 CT6121 D1027241 CLP 2017/00380 3.03E+06 118 41 3.05E+06 1.38E+05 37.91 99.9 F Meat ND 2016 IVb I CC2 SL2 CT6121 D1027241 CLP 2017/00380 3.03E+08 104 41 3.05E+06 1.38E+05 37.79 99.9 F Shusage ND 2016 IVb I CC2 SL2 CT616110 D1027241 CLP 2017/00380 3.02E+08 116 S3 3.05E+06 1.38E+05 37.75 99.9 F Grand beef San Josét 2016 Ibb I CC3 SL3 CT1674 D102776 CLP 2017/00360 3.07E+06 1.38E+06 37.81 99.8 F Chicken San José 2016 Ibb I CC3 SL3 CT1674 D102776 CLP 2017/00360 5.62E+08 1.36E+06	CLIP 2017/00408	4 09E+08	141	66	3.08E+06	1.36E+05	37.81	99.9	н	CSE	Cartagot	2010	IV/b	i	002	SL2	CT6120	ID102743
CLIP 2017/00380 3.43E+08 118 41 3.05E+06 1.39E+05 37.8 99.9 F Meat ND 2016 IVb I CC2 SL2 CT6122 ID12721 CLIP 2017/00380 3.43E+08 128 41 3.05E+06 4.33E+05 37.9 99.9 F Cheese Naranjo 2019 IVb I CC217 SL217 CT222 ID1271 CLIP 2017/00383 3.27E+08 114 41 3.00E+06 1.95E+05 37.7 99.9 F Sutage ND 2016 IVb I CC3 SL3 CT1674 ID102730 CLIP 2017/00380 3.27E+08 116 53 3.14E+06 1.55E+05 37.7 99.9 F Shrimp San José† 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/00380 3.20E+08 110 51 3.10E+06 1.97E+05 37.81 99.8 F Chicken San José 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/00380 3.67E+08 127 43 3.05E+06 1.87E+05 37.81 99.8 F Pork Heredia 2016 IIb I CC3 SL3 CT1674 ID102708 CLIP 2017/00380 3.67E+08 127 43 3.05E+06 1.87E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT1674 ID102708 CLIP 2017/00380 3.67E+08 127 43 3.05E+06 1.87E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00380 4.02E+08 183 44 3.05E+06 1.87E+05 37.81 99.8 F Pork San José 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00380 4.02E+08 183 44 3.05E+06 1.87E+05 37.81 99.7 F Cheese San José 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00380 4.02E+08 132 40 3.05E+06 1.97E+05 37.81 99.8 F Tiapia Guancaset 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00360 3.67E+08 171 44 3.05E+06 3.71E+05 37.81 99.8 F Tiapia Guancaset 2016 IIb I CC3 SL3 CT2730 ID102713 CLIP 2017/00359 3.82E+08 132 40 3.05E+06 3.71E+05 37.81 99.8 PE Drain Alajuela 2016 IIb I CC3 SL3 CT2730 ID102713 CLIP 2017/00370 3.05E+08 174 43 3.05E+06 3.71E+05 37.81 99.8 PE Drain Alajuela 2016 IIb I CC3 SL3 CT2730 ID102715 CLIP 2017/00376 3.05E+08 174 43 3.05E+06 3.71E+05 37.81 99.8 PE Drain Alajuela 2016 IIb I CC3 SL3 CT2730 ID102715 CLIP 2017/00376 3.05E+08 174 42 3.05E+06 3.71E+05 37.81 99.8 PE Drain Alajuela 2016 IIb I CC3 SL3 CT2730 ID102715 CLIP 2017/00376 3.05E+08 174 42 3.05E+06 3.71E+05 37.81 99.8 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102715 CLIP 2017/00376 3.05E+08 132 40 3.05E+06 3.71E+05 37.81 99.8 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102715	CLIP 2017/00406	6.63E+08	228	60	3.07E+06	1.38E+05	37 79	99.9	н	CSE	Cartago	2015	IVb	i	002	SL2	CT6121	ID102740
CLIP 201/02573 8.54E.003 110 11 2.34E.003 12.34E.03 12.34E.03 17.34 10.33E.103 37.34 98.3 F Otherse Natarijo 2019 IVb I CC237 SL217 CT222 ID/2790 CLIP 2017/00383 3.32E+08 104 41 3.00E+06 1.95E+03 7.79 99.9 F Sharanjo 2016 IVb I CC26 SL16 CT2221 ID/22790 CLIP 2017/00366 3.37E+08 116 53 3.14E+06 1.55E+03 7.75 99.8 F Ground beef San Josét 2016 IIb I CC3 SL3 CT1674 ID/22790 CLIP 2017/00366 3.26E+08 127 43 3.05E+06 1.34E+03 3.781 99.8 F Pork San José 2016 IIb I CC3 SL3 CT2730 ID/02710 CLIP 2017/00361 5.29E+08 133 456 3.05E+06 3.781 99.7 F Crincken	CLIP 2017/00380	3 43E+08	118	41	3.05E+06	1 30E+05	37.83	00.0	F	Meat	ND	2016	IVb	i	CC2	SI 2	CT6122	10102724
CLIP 2017/0036 3.02E+06 1.02 1.02E+05 3.7.79 99.9 F Susage ND 2.016 1.05 1 CCIP 2.017/0036 3.27E+08 116 53 3.03E+06 1.55E+05 37.82 99.9 F Susage ND 2.016 1.05+1 1 C116/2017/00367 3.27E+08 116 53 3.14E+06 1.55E+05 37.82 99.9 F Susage ND 2.016 1.05+1 1 C116/2017/00367 3.22E+08 110 51 3.14E+06 1.97E+05 37.75 99.9 PE Drain San Josét 2.016 1.05 1 CCIP 2.017/00367 3.22E+08 1.03 0.05E+06 1.86E+05 37.81 99.8 F Pork Heredia 2.016 1.05 1 CCIP 2.017/00366 3.67E+08 1.27 4.3 3.05E+06 1.87E+05 37.81 99.8 F Pork San Josét 2.016 1.05 1 CCIP 2.017/00366 3.67E+08 1.27 4.3 3.05E+06 1.87E+05 37.81 99.7 F Ground beef San Josét 2.016	CLIP 2017/00303	9.45L+00	285	21	2.015+00	1.330+05	37.03	00.8		Choose	Naranio	2010	IVD IV/b		CC217	SL 217	CT222	ID102724
CLI 2017/00383 3.27E+08 113 59 3.03E+06 1.55E+05 37.82 99.9 F Shrimp San José + 2016 IIb I CC3 SL3 CT12701 ID102722 CLIP 2017/00383 3.27E+08 116 53 3.14E+06 1.55E+05 37.75 99.8 F Ground beef San José + 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/00363 3.28E+08 82 45 3.05E+06 1.34E+05 37.81 99.8 F Pork Heredia 2016 IIb I CC3 SL3 CT12701 ID102716 CLIP 2017/00360 3.67E+08 127 43 3.05E+06 37.81 99.8 F Pork Heredia 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00363 4.02E+08 139 51 3.05E+06 7.81 99.7 F Cheese San José 2016 IIb I CC3 SL3 CT2730 ID102713 CLIP 2017/00364 4.97E+08	CLIP 2019/02/30	3 03E+08	203	41	2.912+00	4.332+03	37.91	99.0		Sausago	ND	2019	IVD IV/b		00217	SLZII	CT2761	10102730
CLIP 2017/00387 3.37E+08 TIS 3.99 3.14E+06 1.58E+05 37.75 99.9 P Similip San José 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/00366 3.20E+08 110 51 3.10E+06 1.37E+05 37.75 99.9 PE Drain San José 2016 IIb I CC3 SL3 CT1674 ID102707 CLIP 2017/00366 3.20E+06 1.34E+05 37.81 99.8 F Chicken San José 2016 IIb I CC3 SL3 CT1730 ID102710 CLIP 2017/00363 3.07E+08 127 43 3.05E+06 1.87E+05 37.81 99.8 F Pork Heredia 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00364 4.02E+08 139 51 3.05E+06 1.87E+05 37.81 99.7 F Cheese San José 2016 IIb I CC3 </td <td>CLIF 2017/00393</td> <td>3.03E+00</td> <td>104</td> <td>50</td> <td>3.000+00</td> <td>1.950+05</td> <td>37.19</td> <td>99.9</td> <td></td> <td>Sausaye</td> <td>ND San lanát</td> <td>2010</td> <td></td> <td>-</td> <td>CC0</td> <td>SL0</td> <td>CT1660</td> <td>10102730</td>	CLIF 2017/00393	3.03E+00	104	50	3.000+00	1.950+05	37.19	99.9		Sausaye	ND San lanát	2010		-	CC0	SL0	CT1660	10102730
CLIP 2017/0036 3.5/E+08 110 53 3.14E+06 1.30E+05 37.79 99.9 PE Drain San José 2016 lib I CC3 SL3 CT1674 ID102716 CLIP 2017/00366 3.20E+08 12 43 3.05E+06 1.34E+05 37.79 99.9 PE Drain San José 2016 lib I CC3 SL3 CT1674 ID102716 CLIP 2017/00366 3.26E+08 183 44 3.05E+06 1.86E+05 37.81 99.8 F Pork Heredia 2016 lib I CC3 SL3 CT2730 ID102711 CLIP 2017/00361 5.29E+08 183 44 3.05E+06 1.82E+05 37.81 99.7 F Cheese San José 2016 lib I CC3 SL3 CT2730 ID102711 CLIP 2017/00365 2.15E+08 74 43 3.05E+06 1.69E+05 37.81 99.7 F Ground beef San José 2016 lib I CC3 SL3 CT2730 ID102714 C	CLIF 2017/00303	3.27 E+00	110	59	3.03E+00	1.5500+05	37.02	99.9		Cround boof		2010			311079	SL10/9	CT1009	ID102722
CLIP 2017/00368 2.32E+08 32.0E+06 1.00 31 3.10E+06 1.37E+05 37.81 99.8 FE Chiran San José 2016 IIb I CC3 SL3 C117/4 D102/16 CLIP 2017/00368 2.38E+08 82 45 3.05E+06 1.38E+05 37.81 99.8 F Pork Heredia 2016 IIb I CC3 SL3 C12730 D102710 CLIP 2017/00363 4.02E+08 133 44 3.05E+06 1.48E+05 37.81 99.7 F Cheese San José+ 2016 IIb <i< td=""> CC3 SL3 C12730 D102710 CLIP 2017/00364 4.97E+08 171 44 3.05E+06 1.68E+05 37.81 99.8 F Cheese San José+ 2016 IIb<i< td=""> CC3 SL3 C12730 D102710 CLIP 2017/00364 4.97E+08 174 43 3.05E+06 3.781 99.8 F Drain Alajuela 2016 IIb<i< td=""></i<></i<></i<>	CLIP 2017/00357	3.37E+00	110	55	3.14E+00	1.30E+05	37.75	99.0				2010			003	SLS	CT1074	ID102707
CLIP 2017/0338 2.38±+08 62 45 3.05±+06 1.34±+05 3.781 99.8 F Clicken San Jose 2016 IID I CC3 SL3 C12730 ID102/08 CLIP 2017/00360 3.67±+08 127 43 3.05±+06 1.86±+05 37.81 99.8 F Pork San José 2016 IID I CC3 SL3 C12730 ID102710 CLIP 2017/00361 5.29±+08 133 51 3.05±+06 1.42±+05 37.81 99.7 F Cheese San José 2016 IID I CC3 SL3 C12730 ID102713 CLIP 2017/00364 4.97±+08 171 44 3.05±+06 1.37±+05 37.81 99.8 F Tiapia Guancaste† 2016 IIb I CC3 SL3 C12730 ID102705 CLIP 2017/00370 3.05±+08 132 40 3.05±+06 3.781 99.8 PE Drain San José 2016 IIb< </td <td>CLIP 2017/00366</td> <td>3.20E+08</td> <td>110</td> <td>51</td> <td>3.10E+06</td> <td>1.97E+05</td> <td>37.79</td> <td>99.9</td> <td>PE</td> <td>Drain</td> <td>San Jose</td> <td>2016</td> <td>dii</td> <td>!</td> <td>003</td> <td>SL3</td> <td>011074</td> <td>ID102716</td>	CLIP 2017/00366	3.20E+08	110	51	3.10E+06	1.97E+05	37.79	99.9	PE	Drain	San Jose	2016	dii	!	003	SL3	011074	ID102716
CLIP 2017/00360 3.67E+08 127 43 3.05E+06 1.86E+05 37.81 99.8 F Pork San Josét 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00363 4.02E+08 139 51 3.05E+06 1.47E+05 37.81 99.8 F Pork San Josét 2016 IIb I CC3 SL3 CT2730 ID102711 CLIP 2017/00364 4.97E+08 171 44 3.05E+06 1.69E+05 37.81 99.7 F Gheese San José† 2016 IIb I CC3 SL3 CT2730 ID102714 CLIP 2017/00365 2.15E+06 74 43 3.05E+06 3.781 99.8 F Train Alajuela 2016 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00370 3.05E+06 3.05E+06 3.781 99.8 PE Drain San José 2016 IIb I CC3 SL3	CLIP 2017/00358	2.38E+08	82	45	3.05E+06	1.34E+05	37.81	99.8	F	Спіскеп	San Jose	2016	IID	I	003	SL3	CT2730	ID102708
CLIP 2017/00361 5.29E+08 127 43 3.05E+06 1.87E+05 37.81 99.8 F Pork Hefedia 2016 lib I CC3 SL3 CT2730 ID102/10 CLIP 2017/00361 5.29E+08 139 51 3.05E+06 1.42E+05 37.81 99.7 F Cheese San José 2016 lib I CC3 SL3 CT2730 ID102/11 CLIP 2017/00365 2.15E+08 171 44 3.05E+06 1.69E+05 37.81 99.8 F Forund beef San José 2016 lib I CC3 SL3 CT2730 ID102713 CLIP 2017/00355 3.25E+08 132 40 3.05E+06 3.7E+05 37.81 99.8 PE Drain Alajuela 2016 lib I CC3 SL3 CT2730 ID102710 CLIP 2017/00370 3.05E+06 105 40 3.05E+06 37.81 99.8 PE Drain San José 2016 lib I CC3 SL3 CT2730 ID102710 CLIP 2017/00371 5.02E+08 <td>0110 0047/00000</td> <td>0.075.00</td> <td>107</td> <td>40</td> <td>0.055.00</td> <td>1.005.05</td> <td>07.04</td> <td></td> <td>-</td> <td>wings</td> <td></td> <td>0040</td> <td></td> <td></td> <td></td> <td>01.0</td> <td>070700</td> <td>10400740</td>	0110 0047/00000	0.075.00	107	40	0.055.00	1.005.05	07.04		-	wings		0040				01.0	070700	10400740
CLIP 2017/00361 5.29E+08 183 44 3.05E+06 1.87E+05 37.81 99.8 F Pork San José† 2016 IIb I CC3 SL3 C12730 ID1027113 CLIP 2017/00363 4.92E+08 139 51 3.05E+06 1.68E+05 37.81 99.7 F Cheese San José† 2016 IIb I CC3 SL3 CT2730 ID102713 CLIP 2017/00364 4.97E+08 171 44 3.05E+06 1.97E+05 37.81 99.8 F Tilapia Guanacaste† 2016 IIb I CC3 SL3 CT2730 ID102713 CLIP 2017/00359 3.82E+08 132 44 3.05E+06 1.97E+05 37.81 99.8 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102719 CLIP 2017/00371 5.02E+08 173 42 3.05E+06 3.781 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2730 ID102710 CLIP 2017/00422	CLIP 2017/00360	3.67E+08	127	43	3.05E+06	1.86E+05	37.81	99.8	F	Pork	Heredia	2016	lib	1	003	SL3	CT2730	ID102710
CLIP 2017/00363 4.02E+08 139 51 3.05E+06 1.42E+05 37.81 99.7 F Cheese San José 2016 IIb I CC3 SL3 CT2730 ID102713 CLIP 2017/00364 4.97E+08 171 44 3.05E+06 1.97E+05 37.81 99.7 F Grund beef San José + 2016 IIb I CC3 SL3 CT2730 ID102714 CLIP 2017/00355 2.15E+08 132 40 3.05E+06 3.71E+05 37.81 99.8 F Tilapia Guanacaster 2016 IIb I CC3 SL3 CT2730 ID102715 CLIP 2017/00370 3.05E+08 105 40 3.05E+06 3.71E+05 37.81 99.8 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102719 CLIP 2017/00370 3.05E+06 1.97E+05 37.81 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2730 ID102720 CLIP 2017/00425 2.84E+08 <	CLIP 2017/00361	5.29E+08	183	44	3.05E+06	1.87E+05	37.81	99.8	F	Pork	San José†	2016	llb	I	CC3	SL3	CT2730	ID102711
CLIP 2017/00364 4.97E+08 171 44 3.05E+06 1.09E+05 37.81 99.7 F Ground beef San José† 2016 IIb I CC3 SL3 CT2730 ID102714 CLIP 2017/00355 2.15E+08 74 43 3.05E+06 3.7.81 99.8 F Tilapia Guanacaste† 2016 IIb I CC3 SL3 CT2730 ID102715 CLIP 2017/00359 3.05E+06 105 40 3.05E+06 1.97E+05 37.81 99.8 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102709 CLIP 2017/00371 5.02E+08 173 42 3.05E+06 1.97E+05 37.81 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2730 ID102756 CLIP 2017/00422 2.34E+08 98 39 3.04E+06 1.97E+05 37.93 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2730 ID102756 CLIP 2017/00367 2.62E	CLIP 2017/00363	4.02E+08	139	51	3.05E+06	1.42E+05	37.81	99.7	F	Cheese	San José	2016	llb	I	CC3	SL3	CT2730	ID102713
CLIP 2017/00365 2.15E+08 74 43 3.05E+06 3.71E+05 37.81 99.8 F Tilapia Guanacaste† 2016 IIb I CC3 SL3 CT2730 ID102719 CLIP 2017/00359 3.82E+08 132 40 3.05E+06 3.71E+05 37.81 99.8 PE Drain Alajuela 2016 IIb I CC3 SL3 CT2730 ID102719 CLIP 2017/00370 3.05E+08 105 40 3.05E+06 2.36E+05 37.81 99.7 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102719 CLIP 2017/00422 2.34E+08 80 39 3.04E+06 1.37E+05 37.92 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102759 CLIP 2017/00425 2.84E+08 98 39 3.04E+06 1.37E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2783 ID102712 <td< td=""><td>CLIP 2017/00364</td><td>4.97E+08</td><td>171</td><td>44</td><td>3.05E+06</td><td>1.69E+05</td><td>37.81</td><td>99.7</td><td>F</td><td>Ground beef</td><td>San José†</td><td>2016</td><td>llb</td><td></td><td>CC3</td><td>SL3</td><td>CT2730</td><td>ID102714</td></td<>	CLIP 2017/00364	4.97E+08	171	44	3.05E+06	1.69E+05	37.81	99.7	F	Ground beef	San José†	2016	llb		CC3	SL3	CT2730	ID102714
CLIP 2017/00359 3.82±+08 132 40 3.05±+06 3.71±+05 37.81 99.8 PE Drain Alajuela 2016 IIb I CC3 SL3 CT2730 ID102709 CLIP 2017/00370 3.05±+08 105 40 3.05±+06 1.97±+05 37.81 99.8 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102709 CLIP 2017/00371 5.02±+08 173 42 3.05±+06 2.36±+05 37.81 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2730 ID102720 CLIP 2017/00425 2.84±+08 98 39 3.04±+06 1.97±+05 37.93 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102759 CLIP 2017/00362 2.62±+08 159 74 3.11±+06 1.35±+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CL	CLIP 2017/00365	2.15E+08	74	43	3.05E+06	1.97E+05	37.81	99.8	F	Tilapia	Guanacaste†	2016	llb	I	CC3	SL3	CT2730	ID102715
CLIP 2017/00370 3.05E+08 105 40 3.05E+06 1.97E+05 37.81 99.8 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102719 CLIP 2017/00371 5.02E+08 173 42 3.05E+06 2.36E+05 37.81 99.7 F Drain San José 2016 IIb I CC3 SL3 CT2730 ID102719 CLIP 2017/00422 2.34E+08 98 39 3.04E+06 1.97E+05 37.92 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102750 CLIP 2017/00425 2.84E+08 98 39 3.04E+06 1.97E+05 37.93 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102759 CLIP 2017/00367 2.62E+08 90 79 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP	CLIP 2017/00359	3.82E+08	132	40	3.05E+06	3.71E+05	37.81	99.8	PE	Drain	Alajuela	2016	llb	I	CC3	SL3	CT2730	ID102709
CLIP 2017/00371 5.02E+08 173 42 3.05E+06 2.36E+05 37.81 99.7 PE Drain San José 2016 IIb I CC3 SL3 CT2730 ID102720 CLIP 2017/00422 2.31E+08 80 39 3.04E+06 2.53E+05 37.92 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102726 CLIP 2017/00425 2.84E+08 98 39 3.04E+06 1.97E+05 37.93 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102756 CLIP 2017/00362 2.62E+08 90 79 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00362 4.62E+08 159 74 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CLI	CLIP 2017/00370	3.05E+08	105	40	3.05E+06	1.97E+05	37.81	99.8	PE	Drain	San José	2016	llb	I	CC3	SL3	CT2730	ID102719
CLIP 2017/00422 2.31E+08 80 39 3.04E+06 2.53E+05 37.92 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102756 CLIP 2017/00425 2.84E+08 98 39 3.04E+06 1.97E+05 37.93 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102756 CLIP 2017/00367 2.62E+08 90 79 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2783 ID102712 CLIP 2017/00362 4.62E+08 159 74 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00368 5.08E+08 175 59 3.10E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CL	CLIP 2017/00371	5.02E+08	173	42	3.05E+06	2.36E+05	37.81	99.7	PE	Drain	San José	2016	llb	I	CC3	SL3	CT2730	ID102720
CLIP 2017/00425 2.84E+08 98 39 3.04E+06 1.97E+05 37.93 99.7 F Cheese Cartago 2013 IIb I CC3 SL3 CT2781 ID102759 CLIP 2017/00367 2.62E+08 90 79 3.11E+06 2.36E+05 37.79 99.9 PE Cooling chamber San José 2016 IIb I CC3 SL3 CT2783 ID102717 CLIP 2017/00362 4.62E+08 159 74 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00368 5.08E+08 175 59 3.10E+06 1.53E+05 37.77 99.9 F Beef Heredia† 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00468 5.08E+08 73 77 2.93E+06 1.20E+05 37.86 99.9 F Cheese Heredia† 2013 IIb I CC5 SL5 CT2776 ID102748	CLIP 2017/00422	2.31E+08	80	39	3.04E+06	2.53E+05	37.92	99.7	F	Cheese	Cartago	2013	llb	I	CC3	SL3	CT2781	ID102756
CLIP 2017/00367 2.62E+08 90 79 3.11E+06 2.36E+05 37.79 99.9 PE Cooling chamber San José 2016 IIb I CC5 SL5 CT2783 ID102717 CLIP 2017/00362 4.62E+08 159 74 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00368 5.08E+08 175 59 3.10E+06 1.53E+05 37.79 99.9 F Beef Heredia† 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00414 2.13E+08 73 77 2.93E+06 1.20E+05 37.86 99.4 F Cheese Heredia† 2013 IIb I CC506 SL506 CT2776 ID102748 CLIP 2017/00414 2.13E+08 73 77 2.93E+06 3.04E+05 37.88 99.9 F Chorizo Heredia† 2016 IIb I CC87 SL87 CT654 ID102770 <tr< td=""><td>CLIP 2017/00425</td><td>2.84E+08</td><td>98</td><td>39</td><td>3.04E+06</td><td>1.97E+05</td><td>37.93</td><td>99.7</td><td>F</td><td>Cheese</td><td>Cartago</td><td>2013</td><td>llb</td><td>I</td><td>CC3</td><td>SL3</td><td>CT2781</td><td>ID102759</td></tr<>	CLIP 2017/00425	2.84E+08	98	39	3.04E+06	1.97E+05	37.93	99.7	F	Cheese	Cartago	2013	llb	I	CC3	SL3	CT2781	ID102759
chamber CLIP 2017/00362 4.62E+08 159 74 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC12793 ID102712 CLIP 2017/00368 5.08E+08 175 59 3.10E+06 1.53E+05 37.79 99.9 F Tilapia San José 2016 IIb I CC12793 ID102712 CLIP 2017/00414 2.13E+08 73 77 2.93E+06 1.20E+05 37.86 99.4 F Cheese Heredia‡ 2013 IIb I CC2776 ID102748 CLIP 2017/00416 2.36E+08 81 38 2.09E+05 37.88 99.9 F Choriz	CLIP 2017/00367	2.62E+08	90	79	3.11E+06	2.36E+05	37.79	99.9	PE	Cooling	San José	2016	llb	1	CC5	SL5	CT2783	ID102717
CLIP 2017/00362 4.62E+08 159 74 3.11E+06 1.35E+05 37.77 99.9 F Tilapia San José 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00368 5.08E+08 175 59 3.10E+06 1.53E+05 37.79 99.9 F Beef Heredia† 2016 IIb I CC5 SL5 CT2793 ID102712 CLIP 2017/00414 2.13E+08 73 77 2.93E+06 1.20E+05 37.86 99.4 F Cheese Heredia† 2013 IIb I CC506 SL506 CT2776 ID102718 CLIP 2019/02619 3.78E+08 130 39 2.97E+06 3.04E+05 37.88 99.9 F Chorizo Heredia† 2013 IIb I CC67 SL87 CT6044 ID102770 CLIP 2017/00416 2.36E+08 81 38 2.92E+06 1.99E+05 37.88 99.9 F Chorizo San José 2016 IIb I CC87 SL87 CT65 ID102770				-						chamber						-		-
CLIP 2017/00368 5.08E+08 175 59 3.10E+06 1.53E+05 37.79 99.9 F Beef Heredia† 2016 IIb I CC5 SL5 CT2793 ID102718 CLIP 2017/00414 2.13E+08 73 77 2.93E+06 1.20E+05 37.86 99.4 F Cheese Heredia† 2016 IIb I CC56 SL50 CT2793 ID102718 CLIP 2017/00414 2.13E+08 73 77 2.93E+06 1.20E+05 37.86 99.4 F Cheese Heredia† 2013 IIb I CC506 SL506 CT2776 ID102748 CLIP 2019/02619 3.78E+08 130 39 2.97E+06 3.04E+05 37.88 99.9 F Chorizo Heredia† 2016 IIb I CC87 SL87 CT6044 ID102770 CLIP 2017/00416 2.36E+08 81 38 2.92E+06 1.99E+05 37.88 99.9 F Chorizo San José 2016 IIb I CC87 SL87 CT65 ID102770	CLIP 2017/00362	4.62E+08	159	74	3.11E+06	1.35E+05	37.77	99.9	F	Tilapia	San José	2016	llb	1	CC5	SL5	CT2793	ID102712
CLIP 2017/00414 2.13E+08 73 77 2.93E+06 1.20E+05 37.86 99.4 F Cheese Heredia† 2013 IIb I CC506 SL506 CT2776 ID102748 CLIP 2017/00414 2.13E+08 130 39 2.97E+06 3.04E+05 37.88 99.9 F Chorizo Heredia† 2013 IIb I CC506 SL506 CT2776 ID102748 CLIP 2019/02619 3.78E+08 130 39 2.97E+06 3.04E+05 37.88 99.9 F Chorizo Heredia† 2019 IIb I CC677 SL87 CT6044 ID102770 CLIP 2017/00416 2.36E+08 81 38 2.92E+06 1.99E+05 37.81 99.9 F Sausage San José 2016 IIb I CC87 SL87 CT654 ID102770 CLIP 2019/02620 3.96E+08 137 39 2.97E+06 2.09E+05 37.88 99.9 F Chorizo San José 2019 IIb I CC87 SL87 CT65 ID102771 <	CLIP 2017/00368	5.08E+08	175	59	3.10E+06	1.53E+05	37.79	99.9	F	Beef	Heredia†	2016	llb	i	CC5	SL5	CT2793	ID102718
CLIP 2019/02619 3.78E+08 130 39 2.97E+06 3.04E+05 37.88 99.9 F Chorizo Heredia 2019 IIb I CC87 SL87 CT6044 ID102770 CLIP 2017/00416 2.36E+08 81 38 2.92E+06 1.99E+05 37.91 99.9 F Sausage San José 2016 IIb I CC87 SL87 CT6044 ID102770 CLIP 2017/00416 2.36E+08 81 38 2.92E+06 1.99E+05 37.81 99.9 F Sausage San José 2016 IIb I CC87 SL87 CT6044 ID102770 CLIP 2019/02620 3.96E+08 137 39 2.97E+06 2.09E+05 37.88 99.9 F Chorizo San José 2019 IIb I CC87 SL87 CT65 ID102770 CLIP 2017/00397 4.04E+08 139 28 3.09E+06 3.73E+05 37.87 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102773 <	CLIP 2017/00414	2 13E+08	73	77	2 93E+06	1 20E+05	37.86	99.4	F	Cheese	Herediat	2013	llb	i	CC506	SI 506	CT2776	ID102748
CLIP 2017/00416 2.36E+08 81 38 2.92E+06 1.99E+05 37.91 99.9 F Sausage San José 2016 IIb I CC87 SL87 CT65 ID102750 CLIP 2017/00416 2.36E+08 137 39 2.97E+06 2.09E+05 37.88 99.9 F Chorizo San José 2019 IIb I CC87 SL87 CT65 ID102770 CLIP 2017/00397 4.04E+08 139 28 3.09E+05 37.87 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102773 CLIP 2017/00388 2.98E+08 103 44 3.09E+05 37.8 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102773 CLIP 2017/00388 2.98E+08 103 44 3.09E+05 37.8 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102732	CLIP 2019/02619	3 78E+08	130	39	2 97E+06	3.04E+05	37.88	99.9	F	Chorizo	Heredia	2019	llb	i	CC87	SI 87	CT6044	ID102770
CLIP 2019/02620 3.96E+08 137 39 2.97E+06 2.09E+05 37.88 99.9 F Chorizo San bosé 2019 IIb I CC87 SL87 CT65 ID102771 CLIP 2017/00397 4.04E+08 139 28 3.09E+05 37.87 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102772 CLIP 2017/00388 2.98E+08 103 4/4 3.04E+05 37.8 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102772 CLIP 2017/00388 2.98E+08 103 4/4 3.04E+05 37.8 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102772	CLIP 2017/00416	2.36E+08	81	38	2 92E+06	1 99E+05	37.91	99.9	F	Sausade	San José	2016	llb	i	CC87	SI 87	CT65	ID102750
CLIP 2017/00397 4.04E+08 139 28 3.09E+06 3.73E+05 37.87 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102722 CLIP 2017/00388 2.98E+08 103 44 3.04E+06 2.02E+05 37.8 100 F Sausage ND 2016 IIc II CC9 SL9 CT13239 ID102732	CLIP 2010/02620	3 96 =+08	137	30	2 97 =+06	2 09E+05	37.88	90.0	F	Chorizo	San José	2010	llh	i	CC87	SI 87	CT65	ID102771
CIII 2017/0038 2 08E+08 203 4A 3 04E+08 2 02E+00 3.00E+00 31.01 100 F 3 alloage ND 2010 IIC II CC9 SL9 CI13239 ID10232	CLIP 2013/02020	1 01E+09	130	28	2.07 E +00	3 73E+05	37.87	100	í F	Sausado	ND	2013		i.	0007	SLO	CT13220	10102771
	CLIP 2017/00388	2 08E+08	103	44	3.04E+06	2 02E+05	37.8	100	F	Pork	ND	2016	lle	ü	000	SIG	CT1668	10102732

	No. bases after		No.	Total			% cgMLST	Source		Geographic	Isolation			Clonal complex,	Sublineage,	cgMLST	
Isolate no.	filtering	Coverage	contigs	length, bp	N50, bp	% GC	loci tagged	type	Sample type	location	year	Serogroup	Lineage	MLST	cgMLST	type	BIGSdb ID
CLIP 2017/00394	3.41E+08	117	38	3.09E+06	2.01E+05	37.79	100	F	Frozen	ND	2016	lla	II	CC121	SL121	CT909	ID102729
									vegetables								
CLIP 2019/02743	3.86E+08	133	18	2.83E+06	3.82E+05	37.93	99.9	F	Cheese	Turrialba	2018	lla	П	CC19	SL378	CT6064	ID102776

*BIGSdb, Bacterial Isolate Genome Sequence Database (*17*); cgMLST, core-genome multilocus sequence typing; F, food; H, human; ID, identification; MLST, multilocus sequence typing; ND, not done; PE, production environment. †Geographic information available only at the level of the province.

Appendix Table 2. Previously reported cgMLST types detected in this study (cutoff of 7 or less allelic differences out of 1748 cgMLST loci, Institut Pasteur scheme)

cgMLST Type	Source	ce (item)	Studies from other		NCBI/EBI/DDJJ	Reference		
(CC, serogroup)	This study	Other studies	countries	Source lab	accession no.	no.		
Lineage I								
L1-SL217-ST217-	F (dairy)	H, F (salad)	US	CDC	SRR1021894,	(8)		
CT222 (CC217, IVb)					SRR1027089			
L1-SL1-ST1-CT333	H, F (dairy)	Н	US	CDC	SRR1043171,	(8,17)		
(CC1, IVb)					SRR7057542			
L1-SL87-ST847-	F (meat)	F (avocado)	MX	FDA	SRR975360	(8)		
CT65 (CC87, Ilb)								
Lineage II	F //				EBB 400 400 4			
L2-SL121-S1121-	F (frozen	H, F, PE, FE, A	CL, DK, FR, DE, LV,	KMAHVH,	ERR1304231,	(8,10,18,19)		
C1909 (CC121, IIa)	vegetables)		NO, PL, NL, UK, US	ANSES,	ERR1/38038,			
					ERR 17 30030,			
				UKHSA	ERR2522041,			
				FDA RKI	ERR2522200,			
				10/0,100	ERR2522284			
					ERR2522292.			
					ERR2522294.			
					ERR2522295,			
					ERR2522297,			
					ERR2522312,			
					ERR2522337,			
					ERR2522338,			
					ERR2522353,			
					ERR2522363,			
					ERR2522371,			
					ERR2322010,			
					ERR3040059,			
					ERR3040067			
					ERR3040072.			
					ERR3040073,			
					ERR3040075,			
					ERR3040076,			
					ERR3040078,			
					ERR3040083,			
					ERR3040104,			
					ERR4176403,			
					ERR4170497, ERR/176536			
					ERR4176606			
					ERR4176666.			
					ERR4176794,			
					ERR4648214,			
					SRR10753542,			
					SRR10753574,			
					SRR10753599,			
					SRR10753600,			
					SRR10753602,			
					SRR11004717, SPR13072765			
					SRR14783257			
					SRR15245555.			
					SRR15245949,			
					SRR20053048,			
					SRR2040689,			
					SRR4052010,			
					SRR4052014,			
					SRR4052068,			
					SRR4052071,			
					SKK4052072,			
					3RR4032073, SRR1052161			
					SRR4124034			
					SRR4124934,			
					SRR5133499			
					SRR5318940.			

cgMLST Type	Sourc	ce (item)	Studies from other		NCBI/EBI/DDJJ	Reference
(CC, serogroup)	This study	Other studies	countries	Source lab	accession no.	no.
					SRR5526029,	
					SRR5526031,	
					SRR5526035.	
					SRR5526085	
					SRR5526092	
					SRR5526004	
					SDD5526007	
					SRR5520097,	
					SRR3320099,	
					SRR3320101,	
					SRR5526105,	
					SRR5526120,	
					SRR5526126,	
					SRR5526128,	
					SRR5526130,	
					SRR5526135,	
					SRR5526137,	
					SRR5526138,	
					SRR5526142,	
					SRR5526145,	
					SRR5526155,	
					SRR5647016,	
					SRR5647027.	
					SRR5647029.	
					SRR5647030	
					SRR6966182	
					SRR7403111	
					SPR7/1062/	
					SRR7470024, SRR7420735	
					SDD7429733,	
					SRR/429/01, SDD7//0567	
					SRR7440507,	
					SRR7440606,	
					SRR7440615,	
					SRR/440018,	
					SRR7440621,	
					SRR7440634,	
					SRR/440649,	
					SRR7440688,	
					SRR7440921,	
					SRR7441075,	
					SRR7441146,	
					SRR7441209,	
					SRR7441250,	
					SRR7441287,	
					SRR7547848,	
					SRR7827106,	
					SRR7828078,	
					SRR7839361,	
					SRR7841130,	
					SRR7841155,	
					SRR7841205.	
					SRR7842337.	
					SRR7850202	
					SRR7850362.	
					SRR7850428	
					SRR7850452.	
					SRR7866225	
					SRR7866376	
					SRR7866514	
					SRR7866571	
					SRR7866588	
					SRR7866636	
					SINT/000030,	
					SINT/000072,	
					SKK/000/2/,	
					SKK/000/30,	
					SKK/000091,	
					SKK/8/3595,	
					SRR7873692,	
					SRR7873717,	

cgMLST Type	Sour	ce (item)	Studies from other		NCBI/EBI/DDJJ	Reference
(CC, serogroup)	This study	Other studies	countries	Source lab	accession no.	no.
					SRR7873744,	
					SRR8235628,	
					SRR8239064,	
					SRR8239220,	
					SRR8239239,	
					SRR8655304,	
					SRR8979699,	
					SRR9004322,	
					SRR9010038	
**				· · · T	" FR 00 1 1	

*A, animal; ANSES, Agence Nationale de Sécurité Sanitaire de L'Alimentation, de L'Environnement et du Travail, FR; CC, clonal complex; CDC, US Centers for Disease Control and Prevention; CL, Chile; DE, Germany; DK, Denmark; ECDC, European Centre for Disease Prevention and Control; F, food; FDA, US Food and Drug Administration;FE, farm environment; FR, France; H, human; IP, Institut Paster, FR; KMAHVH, Klinisk Mikrobiologisk Afdeling, DK; LV, Latvia; MX, Mexico; NO, Norway; PE, food production environment; PL, Poland; RKI, Robert Koch Institut, DE; UK, United Kingdom; UKHSA, UK Health Security Agency, UK; US, United States; UWLMO, University of Warmia and Mazury in Olsztyn, PL.



Appendix Figure 1. Single linkage dendrogram of 92 isolates generated for genome-based characterization of *Listeria monocytogenes*, Costa Rica. Dendrogram based on cgMLST allelic profiles (1,748-locus scheme). Branches are colored according to lineages: L1, red; L2, blue. Branches are labeled according to lineages, sublineages, and clonal complexes. Information on isolates' name, serogroup, source, sample type, cgMLST type, year of isolation, location, and BIGSdb IDs are provided in the columns. Colors in location column correspond to dots on map. Gray bars indicate clusters of isolates

with // allelic differences out of 1,748 cgMLST loci. presence of selected virulence and resistance genetic traits in each isolate is represented by squared dark blue boxes and empty boxes denote genes with premature stop codons. BIGSdb, Bacterial Isolate Genome Sequence Database (https://bigsdb.pasteur.fr); CC, clonal complex; cgMLST, core-genome multilocus sequence typing; F, food; H, human; ID, identification; L, lineage; LIPI, listeria pathogenicity island; SL, sublineage; ST, sequence type.



Appendix Figure 2. Minimum spanning tree of 92 *Lysteria monocytogenes* isolates, Costa Rica, 2009–2019. Trees are based on cgMLST allelic profiles (7-locus scheme). A) Lineage I isolates; B) lineage 2 isolates. Publicly available *L. monocytogenes* isolates (n = 351) from neighboring countries in the Caribbean region were also included. Circles represent different profiles and sizes are proportional to the number of isolates within. Branch lengths are proportional to the allelic differences between the profiles which are indicated in the branches. For simplicity, allelic differences of 1 are omitted and represented by thicker branch lines. Clonal complexes with >1 profile are surrounded by gray shading and labeled if detected in this study or if they contain \geq 5 isolates. CC, clonal complex; cgMLST, core-genome multilocus sequence typing; ST, sequence type.



Appendix Figure 3. Minimum spanning tree of 92 *Lysteria monocytogenes* isolates, Costa Rica, 2009–2019. Trees are based on cgMLST allelic profiles (1,748-locus scheme). A) Lineage I isolates; B) lineage 2 isolates. Circles represent different profiles and sizes are proportional to the number of isolates within. Labels next to circles indicate the source of isolates. Branch lengths are proportional in logarithmic scale to allelic differences between profiles, which are also indicated in the branches. For simplicity, allelic differences of \leq 7 are omitted and represented by thicker branch lines. Clusters with >1 profile are highlighted in colors; labels correspond with cgMLST type and are delimitated by gray shadows. Dashed ellipses delimitate sublineages with >1 isolate and labeled with corresponding sublineage. cgMLST, coregenome multilocus sequence typing; CT, cgMLST type; F, food; H, human, PE; production environment; SL, sublineage.