SUPPLEMENTARY MATERIAL

Table S1: *Lactococcus lactis* and *cremoris* strains used for the sequences alignment of the *gadB* gene to design primers and probes for ddPCR assays.

Strain	Accession number or WGS	*Species*
NCDO2118	CP009054.1	*lactis*
NCDO2727	Unpublished results	*lactis*
KF147	CP001834	*lactis*
KLDS4.0325	CP006766	*lactis*
FM03	CP020604	*lactis*
UC77	CP015906	*lactis*
UL8	CP015908	*lactis*
UC063	CP015905	*lactis*
229	CP015896	*lactis*
IL1403	CP033607	*lactis*
C10	CP015898	*lactis*
CV56	CP002365	*lactis*
275	CP015897	*lactis*
184	CP015895	*lactis*
A12	LT599049	*lactis*
S0	CP010050	*lactis*
UC11	CP015904	*lactis*
UC08	CP015903	*lactis*
IO-1	NC_020450	*lactis*
UC06	CP015902	*lactis*
AI06	CP009472	*lactis*
NZ9000	CP002094	*cremoris*
MG1363	NC_009004	*cremoris*
EIP31B	Unpublished results	*cremoris*
EIP36H	Unpublished results	*cremoris*
NCDO763	LITG01	*cremoris*
N41	LITA01	*cremoris*
MET520	Unpublished results	*cremoris*
MET521	Unpublished results	*cremoris*
MET523	Unpublished results	*cremoris*
GE214	AZSI01	*cremoris*
DPC6856	LAVW01	*cremoris*
KW2	CP004884	*cremoris*
A17	JQIC01	*cremoris*
V4	LIYG01	*cremoris*
Mast36	JZUI01	*cremoris*
DPC6860	LAVX01	*cremoris*
MET516	Unpublished results	*cremoris*
MET233	Unpublished results	*cremoris*

UC509.9	CP003157	*cremoris*
158	CP015894	*cremoris*
UC109	CP015907	*cremoris*
SK11	CP000425	*cremoris*
JM3	CP015901	*cremoris*
A76	CP003132	*cremoris*
JM2	CP015900	*cremoris*
JM1	CP015899	*cremoris*
JM4	CP015909	*cremoris*
MET539	Unpublished results	*cremoris*
MET555	Unpublished results	*cremoris*
MET542	Unpublished results	*cremoris*
MET541	Unpublished results	*cremoris*
HP	LIYE01	*cremoris*
LMG6897	LISZ01	*cremoris*
AM2	LITE01	*cremoris*
FG2	LITD01	*cremoris*
WG2	LXWJ01	*cremoris*

Table S2: *Lactococcus lactis* biovar diacetylactis strains used for the sequences alignment of the *citD* gene to design primers and probe for ddPCR assays.

Strain	**Accession number or WGS**
IL1403	NC002662.1
FM03	CP020604.1
UC77	CP015906.1
229	CP015896.1
184	WJUU01
CRL264	LKPE01
LMG19460	MUBH01000001.1
DRA4	LIWD01000232.1
TIFN2	ATBF01000049.1
TIFN4	ATBD01000019.1
LD61	AXZK01000045.1

Table S3: ANOVA results examining the influence of temperature and pH on the populations of the *lactis* and *cremoris* species and the biovar diacetylactis during milk fermentation.

		one-way ANOVA		**post-hoc test**	
Condition	**ratio**	**F**	**p value**	**T1 vs. T0**	**T2 vs. T1**
22°C					
	P_{lac}/P_{tot}	F(2,17)=57.02	<0.001	<0.001	1.000

	P_{cre}/P_{tot}	F(2,17)=35.10	<0.001	<0.001	1.000
	P_{cit}/P_{lac}∗	F(2,8.59)=38.96	<0.001	0.006	1.000
35°C					
	P_{lac}/P_{tot}	F(2,18)=95.56	<0.001	1.000	<0.001
	P_{cre}/P_{tot}	F(2,18)=118.19	<0.001	0.083	<0.001
	P_{cit}/P_{lac}∗	F(2,7.22)=68.64	<0.001	0.006	0.012

		two-way ANOVA		**post-hoc test**	
				35°C vs. 22°C	
Ratio	**term**	**F**	**p value**	**T1**	**T2**
P_{lac}/P_{tot}					
	Temperature	F(1,25)=113.46	<0.001		
	pH	F(1,25)=126.69	<0.001		
	Interaction	F(1,25)=105.14	<0.001	<0.001	0.633
P_{cre}/P_{tot}					
	Temperature	F(1,25)= 95.67	<0.001		
	pH	F(1,25)=109.27	<0.001		
	Interaction	F(1,25)=100.54	<0.001	<0.001	0.413

∗ Welch's ANOVA and Games–Howell post–hoc test

P_{lac}/P_{tot}, P_{cre}/P_{tot} and P_{cit}/P_{lac} ratios were quantified at the start of the fermentation (T0) and when pH reached 4.5 (T1) and then 4.3 (T2), at two different temperatures, 22 °C and 35 °C. Data exhibiting unequal variance across times T0, T1 and T2 were analyzed using a Welch's ANOVA combined with a post-hoc Games-Howell test. P-values from the contrast of interest are reported.