ADRIA FOOD EXPERTISE

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NF VALIDATION
Validation of alternative analytical methods
Application in food microbiology

Summary report
Validation study according to EN ISO 16140-2:2016

3M™ Petrifilm™ *Enterobacteriaceae* Count Plate
(Certificate number: 3M 01/06 - 09/97)
for the enumeration of *Enterobacteriaceae* in all human food products, animal feed and production environmental samples

Quantitative method

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This report consists of 55 pages, including 8 appendices.
Only copies including the totality of this report are authorized.

Competencies of the laboratory are certified by COFRAC accreditation for the analyses marked with the symbol◆.

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Quality Assurance documents related to this study can be consulted upon request from **3M Food Safety**.

The technical protocol and the result interpretation were carried out according to the EN ISO 16140-2:2016 and the AFNOR technical rules (PR revision 7).

Validation protocols	▪ ISO 16140-1 (2016): Microbiology of the food chain - Method validation — *Part 1: Vocabulary* ▪ ISO 16140-2 (2016): Microbiology of the food chain - Method validation — *Part 2: Protocol for the validation of alternative (proprietary) methods against a reference method* ▪ AFNOR technical rules (PR Revision 7).
Reference methods♦	NF ISO 21528-2 (June 2017) - Microbiology of food and animal feeding stuffs - Horizontal methods for the detection and enumeration of *Enterobacteriaceae* - Part 2: colony-count method
Alternative method	**3M™ Petrifilm™ *Enterobacteriaceae* Count Plate**
Scope	☒ **All human food** ☒ **Animal feed** ☒ **Production environmental samples**
Certification organism	AFNOR Certification (http://nf-validation.afnor.org/)

♦ Analyses performed according to the COFRAC accreditation

1 INTRODUCTION

The **3M™ Petrifilm™ *Enterobacteriaceae* Count Plate (EB)** was validated in September 1997 (Certificate number 3M 01/06 - 09/97) for human food products.

Date	Study	Expert laboratory	Standards used
September 1997	Initial validation	ADRIA	/
December 2001	Renewal study	ADRIA	/
June 2005	Renewal study	ADRIA	ISO 16140 (2003)
July 2009	Renewal study	ADRIA	ISO 16140 (2003)
April 2010	Extension study for animal food products	ADRIA	ISO 16140 (2003)
July 2013	Renewal study	ADRIA	ISO 16140 (2003) ISO 16140/A1 (2011)
February 2015	Extension study for production environmental samples	ADRIA	ISO 16140 (2003) ISO 16140/A1 (2011)
October 2017	Renewal study	ADRIA	ISO 16140-2 (2016)
June 2021	Renewal study	ADRIA	ISO 16140-2 (2016)

2 METHODS DESCRIPTION

2.1 Alternative method

2.1.1 Principle

The 3M™ Petrifilm™ *Enterobacteriaceae* Count (EB) Plate is a sample-ready-culture medium system which contains modified Violet Red Bile Glucose (VRBG) nutrients, a cold-water soluble gelling agent, and a tetrazolium indicator that facilitates colony enumeration. 3M Petrifilm EB Plates are used for the enumeration of *Enterobacteriaceae* in the food and beverage industries. *Enterobacteriaceae* are oxidase-negative, Gram-negative rods that ferment glucose to produce acid and/or gas. On 3M Petrifilm EB Plates, *Enterobacteriaceae* will appear as red colonies with yellow zones, red colonies with gas bubbles, or red colonies with yellow zones and gas bubbles.

2.1.2 Protocol

The flow diagram is provided in **Appendix 1**.

2.1.3 Restrictions

There is no restriction.

2.2 Reference methods◆

The reference method used for the renewal study is the NF ISO 21528-2 (June 2017) - Microbiology of food and animal feeding stuffs - Horizontal methods for the detection and enumeration of *Enterobacteriaceae* - Part 2: colony-count method.

The flow diagram is provided in **Appendix 2**.

The reference method allows an incubation at 30°C or 37°C; only the incubation at 37°C was tested in this study.

2.3 Protocol applied during the initial validation and the renewal study

The minimum incubation time was applied during the validation studies: 22 h at 37°C ±1°C.

◆ Analysis performed according to the COFRAC accreditation

3 INITIAL VALIDATION STUDY AND EXTENSION / RENEWAL STUDIES: RESULTS

The study was carried out on a diversity of samples and strains representative of agri-food products. This does not constitute an exhaustive list of the different matrices included in the scope.
For any comment on the alternative method, please contact AFNOR Certification at http://nf-validation.afnor.org/contact-2/.

3.1 Method comparison study

The method comparison study is a study performed by the expert laboratory to compare the alternative method with the reference method.

3.1.1 Relative trueness study

The relative trueness is the degree of correspondence between the response obtained by the reference method and the response obtained by the alternative method on identical sample.

3.1.1.1 Number and nature of the samples

Seven categories were tested. The repartition per tested category and type is provided in Table 1.

Table 1 – Categories and types

Category		Type		Number of analyzed samples	Number of interpretable results
1	**Meat products**	a	Poultry meat raw and cooked	7	7
		b	Pork , beef, veal raw and cooked	7	7
		c	Delicatessen	15	15
			Total	*29*	*29*
2	**Dairy products**	a	Milk and cream	5	5
		b	Cheeses	16	16
		c	Dairy desserts, milk powders	10	10
			Total	*31*	*31*
3	**Seafood**	a	Raw	10	6
		b	Cooked	5	5
		c	Ready to eat or to reheat	6	6
			Total	*21*	*17*
4	**Vegetables**	a	Fresh and frozen raw products	9	9
		b	Fresh and frozen seasoned raw products	5	5
		c	Cooked vegetables	5	5
			Total	*19*	*19*
5	**Miscellaneous and egg-based products**	a	Composite food	5	5
		b	Pastries, chocolate	5	5
		c	Egg based products	6	6
			Total	*16*	*16*
6	**Feed stuff**	a	Fresh product	6	6
		b	Cooked or dehydrated product	5	5
		c	Raw materials	9	5
			Total	*20*	*16*
7	**Production environmental samples**	a	Surfaces	18	6
		b	Process water	10	5
		c	Dusts	7	5
			Total	*35*	*16*
ALL CATEGORIES				**171**	**144**

171 samples were analyzed, leading to 144 exploitable results by both methods.

3.1.1.2 Artificial and natural contamination of the samples

Artificial contaminations were realized by spiking or seeding protocols. The inoculated strains, the contamination protocols, the injured protocols of the inoculated cells and the injury evaluation are provided in **Appendix 3** . Injury efficiency was evaluated by enumerating the pure culture on selective and non-selective agars. The observed injury measurements vary from 0.4 to more than 3.40 log CFU/ml difference.

107 samples were naturally contaminated representing 74.3% of the samples, and 49 samples were artificially contaminated; 37 gave interpretable results.

3.1.1.3 Raw data

The raw data are provided in **Appendix 4**.

The samples were analyzed by the reference and the alternative methods in order to have 15 interpretable results per incubation protocol, and 5 interpretable results per tested type.

The data are classified in three categories (See Table 2):

- Interpretable results with the reference and the alternative methods;
- Results with less than 4 colonies per plate with the reference and/or the alternative method (indicated with "*" in the data) in order to have a more precise result. These results are not included in the calculation.
- Results below or above the quantification limit: according to the ISO 16140-2:2016, if any result (either reference or alternative method) is below the quantification limit, the data should be plotted using a substituted value of 1 $\log_{10}$ units less than the observed value in case of a lower than value. Similarly, any value greater than the upper limit should be amended by adding 1 log unit. These results are not included in the calculations but also appear on the graphs.

Table 2 - Classification of the data

Category		Number of samples analyzed	Number of samples with < 4 CFU/plate	Number of samples below or above the detection limit	Number of samples with interpretable results
1	Meat products	29	0	0	29
2	Dairy products	31	0	0	31
3	Seafood	21	0	4	17
4	Vegetables	19	0	0	19
5	Miscellaneous and egg-based products	16	0	0	16
6	Feed stuff	20	0	4	16
7	Production environmental samples	35	2	17	16
	TOTAL	**171**	**2**	**25**	**144**

The samples, which were not used in the calculations, are provided in Table 3.

Table 3 - Samples which were not used in the calculations

Sample number	Product (French name)	Reference method: ISO 21528-2♦	Alternative method : 3M Petrifilm *Enterobacteriaceae*	Category	type
154	Raw material	<4,27	5,47	6	c
441	Raw material	<0,85	1,30*	6	c
3676	Dusts from egg industry	<1,00	<1,00	7	c
3677	Dusts	<1,00	<1,00	7	c
3841	Process water (peas)	<1,00	<1,00	7	b
3844	Wipe (peas industry)	1,30*	2,15	7	a
3845	Process water (peas)	<1,00	2,01	7	b
3904	Wipe (pastry industry)	2,00*	3,53	7	a
3905	Wipe (bechamel sauce)	<2,00	3,17	7	a
3906	Wipe (cheese industry)	<1,00	<1,00	7	a
3907	Process water (milk industry)	<2,00	<2,00	7	b
4007	Process water (fish industry)	<0,00	<0,00	7	b
4009	Process water (fish industry)	<2,00	3,63	7	b
4011	Swab after cleaning (fish industry)	<1,00	<1,00	7	a
4012	Swab after cleaning (fish industry)	<1,00	<1,00	7	a
4013	Wipe after cleaning(fish industry)	>4,13	>4,00	7	a
4015	Wipe after cleaning(fish industry)	<1,00	<1,00	7	a
4494	Wipe (dishwasher)	>4,18	>4,00	7	a
4495	Wipe (table)	>4,18	>4,00	7	a
4496	Wipe (cutter)	>4,18	>4,00	7	a
4497	Wipe (push-button)	>5,18	>5,00	7	a
6160	Raw fish	<2,00	3,69	3	a
6161	Raw fish	<3,00	4,18	3	a
6163	Poultry proteins dehydrated	<1,00	<1,00	6	c
6164	Poultry proteins dehydrated	<1,00	<1,00	6	c
6884	Hake fillet	<1,00	<1,00	3	a
6885	Cod fillet	<1,00	<1,00	3	a

3.1.1.4 Statistical interpretation

The calculations are provided in **Appendix 5**.

The obtained data were analyzed using the scatter plot. The graphs are provided with the line of identity (y = x).
The Figures 1 to 7 show the data plotted for the different studied categories, and the Figure 8 for all the products.

♦ Analyses performed according to the COFRAC accreditation

Figure 1 - Data plotted for the Meat products

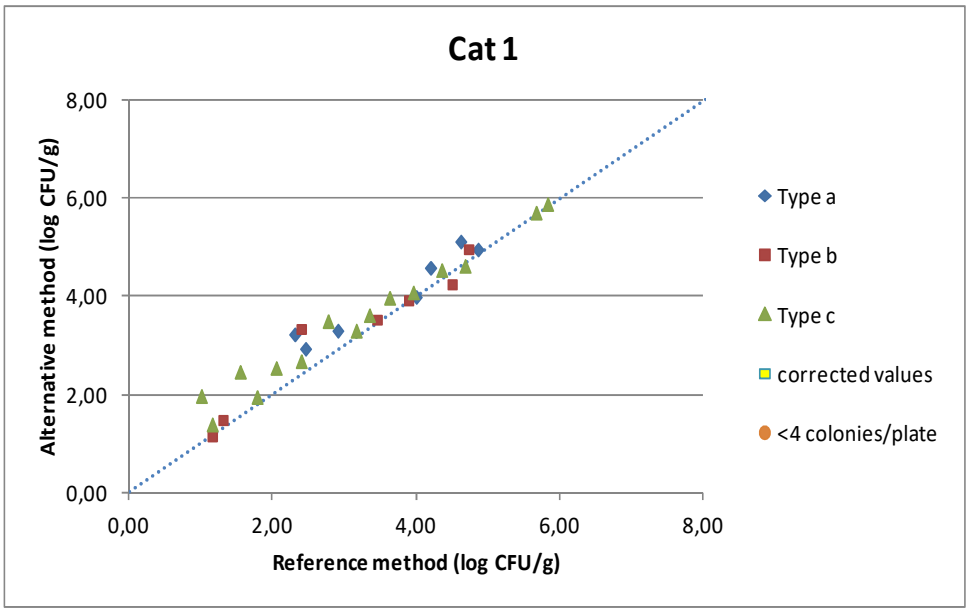


Figure 2- Data plotted for Dairy products

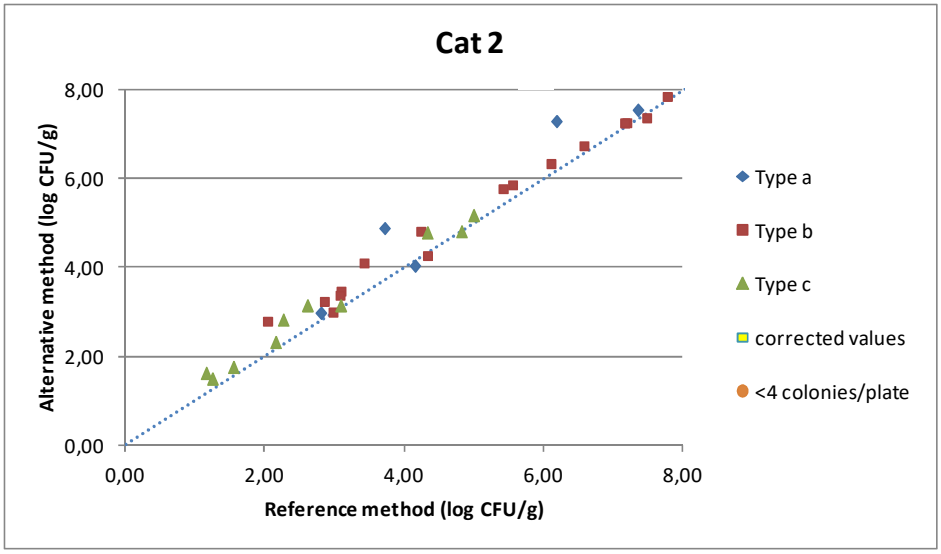


Figure 3- Data plotted for Seafood

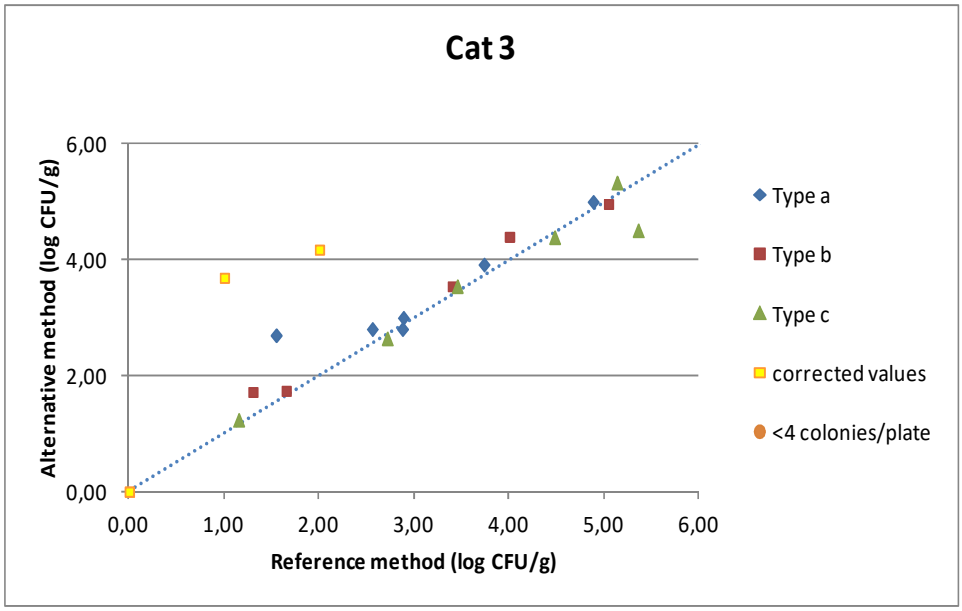


Figure 4- Data plotted for Vegetables

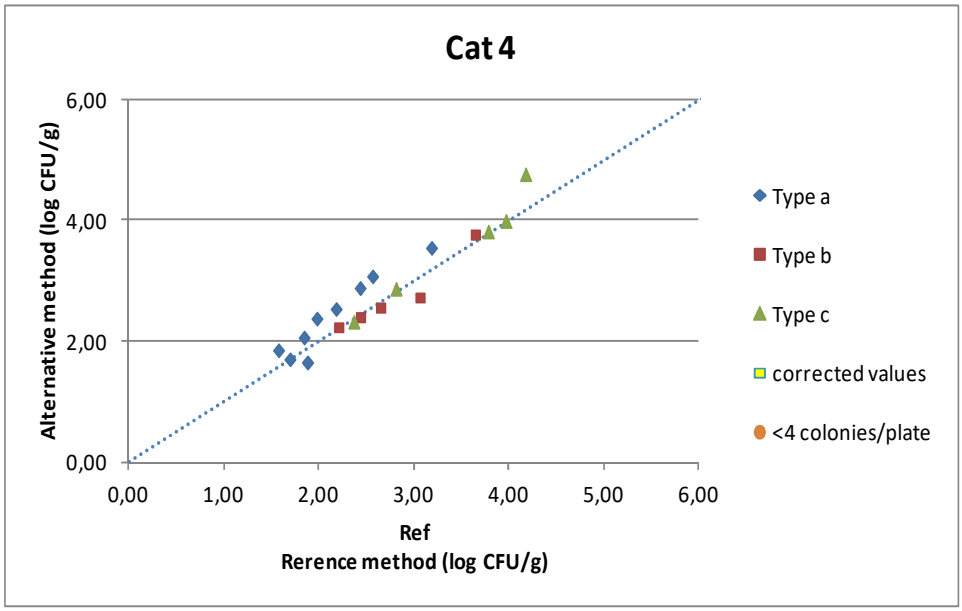


Figure 5- Data plotted for Miscellaneous and egg-based products

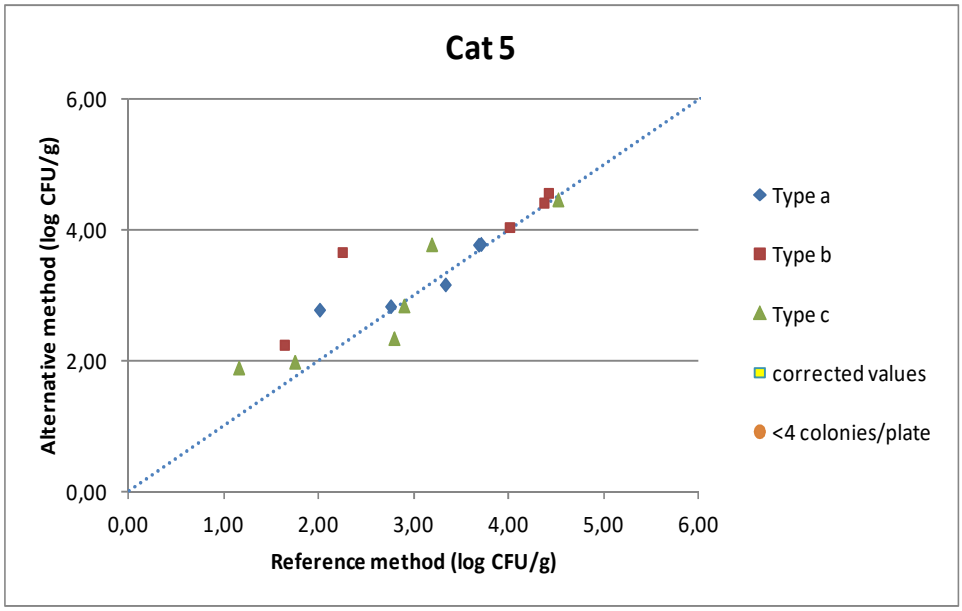


Figure 6- Data plotted for Feed stuff

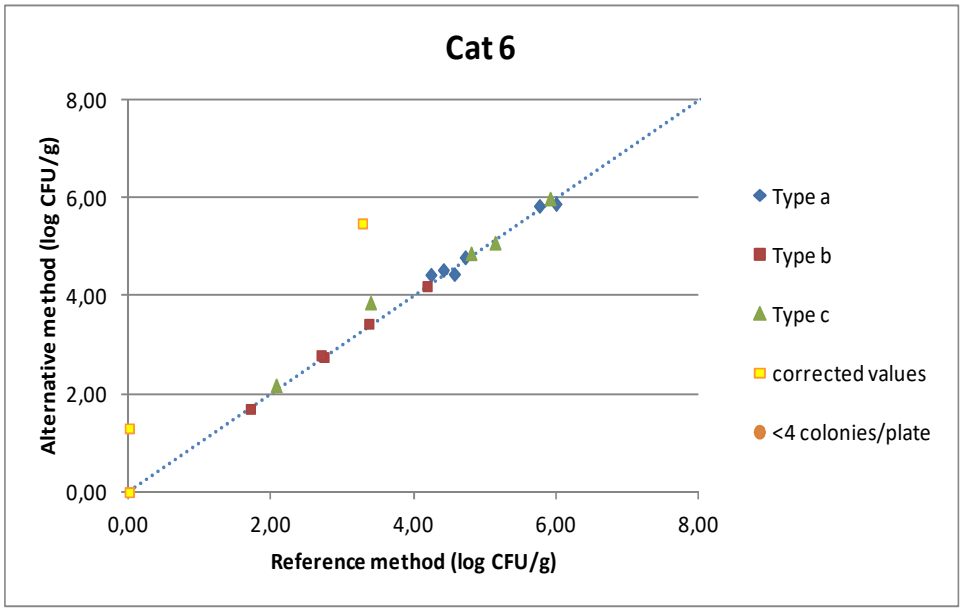


Figure 7- Data plotted for Production environmental samples

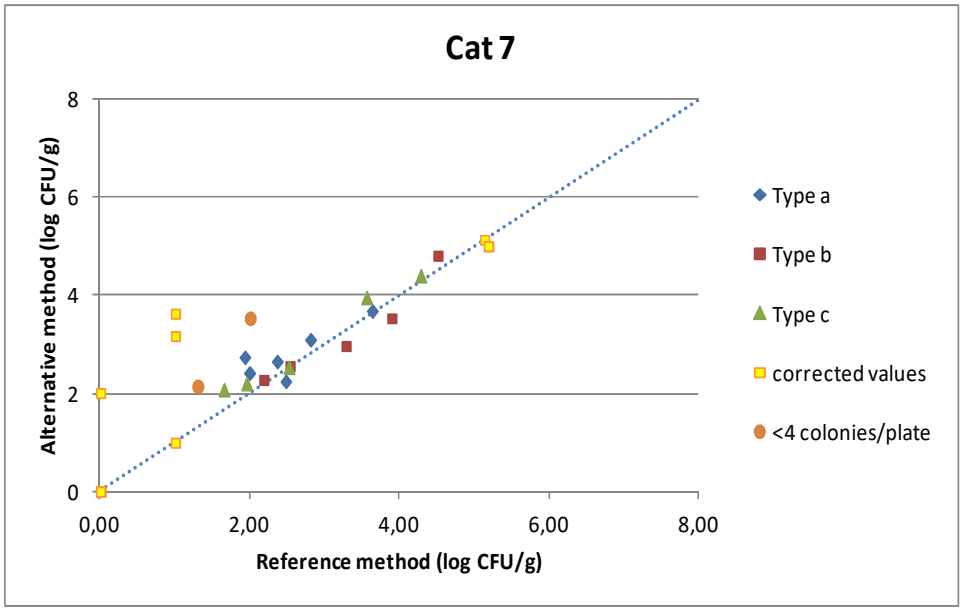
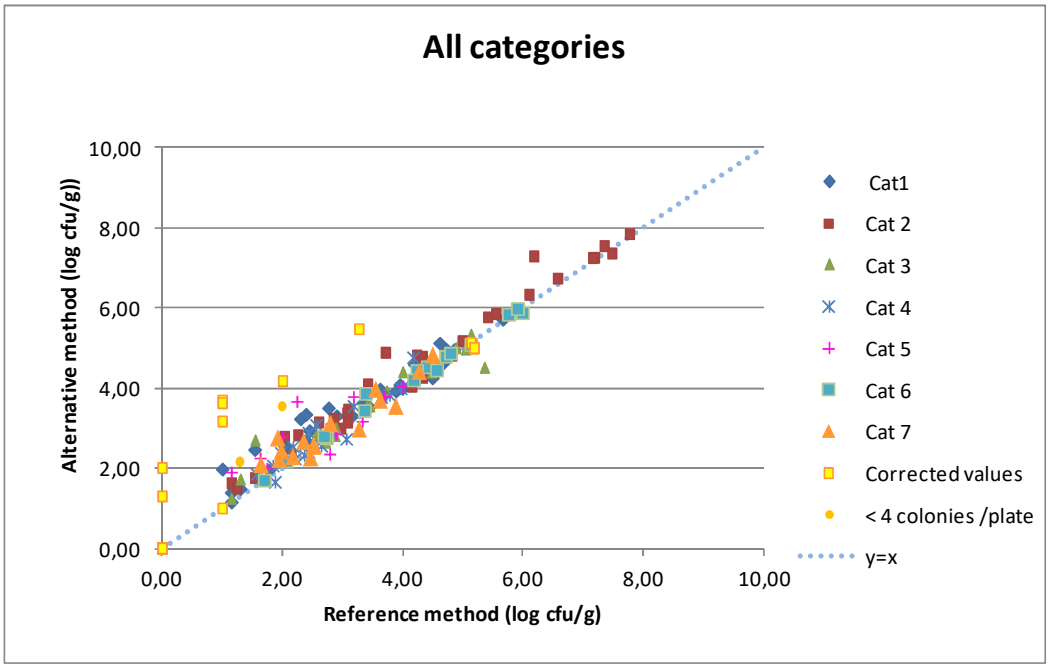


Figure 8 - Data plotted for all the products



The calculated values for Average difference and Standard deviation differences per category are provided in Table 4.

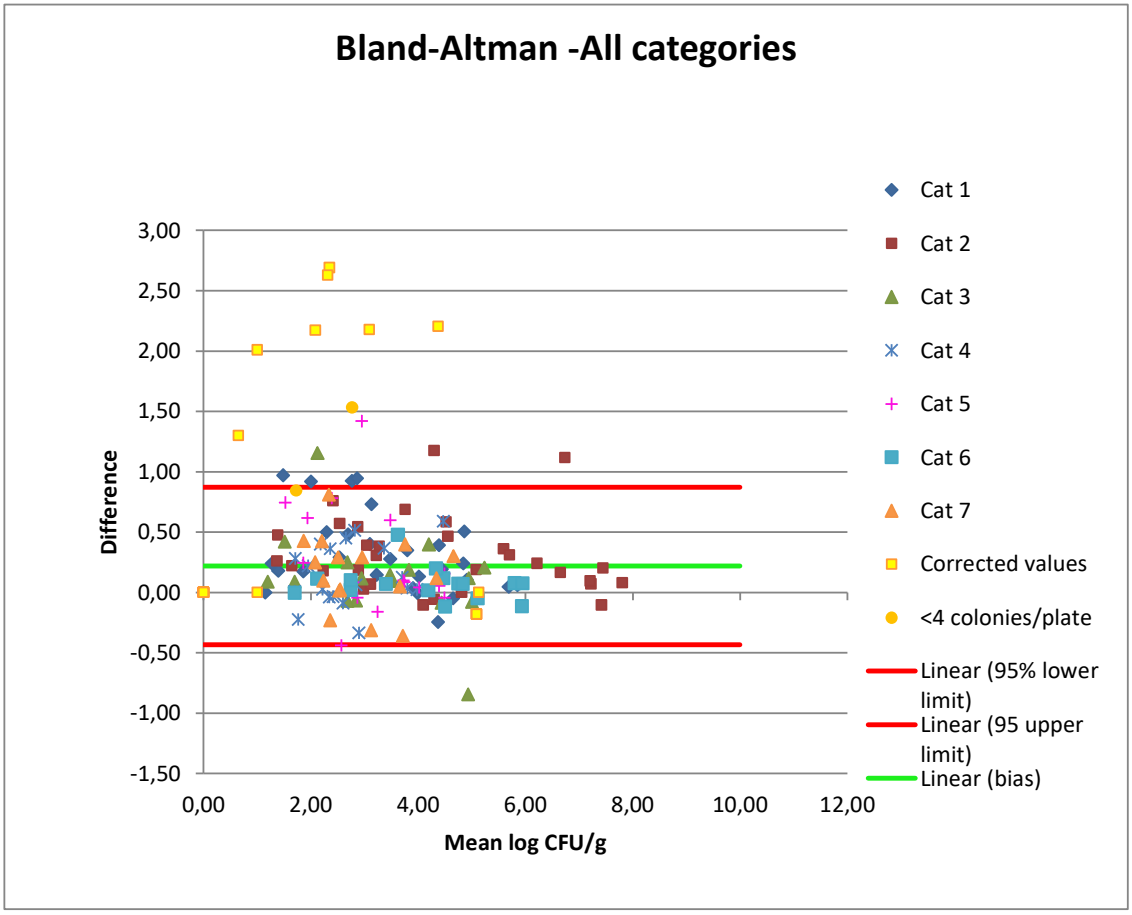
Table 4 - Calculated values

Category		n	$\bar{D}$	SD	Linear bias	95% lower limit	95% upper limit
1	Meat products	29	0,31	0,32	0,31	-0,36	0,99
2	Dairy products	31	0,32	0,31	0,32	-0,33	0,96
3	Seafood products	17	0,12	0,38	0,12	-0,69	0,94
4	Vegetables	19	0,14	0,25	0,14	-0,40	0,69
5	Miscellaneous and egg-based products	16	0,26	0,46	0,46	-0,55	1,46
6	Feed stuff	16	0,07	0,14	0,07	-0,23	0,37
7	Production environmental samples	16	0,16	0,30	0,16	-0,51	0,83
All categories		**144**	**0,22**	**0,33**	**0,22**	**-0,43**	**0,87**

$\bar{D}$: Average difference SD: Standard deviation of differences

The Bland-Altman difference plot for all the samples is given Figure 9.

Figure 9 – Bland-Altman difference plot for all the samples



The average difference observed varies from 0.07 log to 0.32 log.

Samples for which the difference between the result observed with the reference and the alternative methods is above or lower than the limits are listed in Table 5.

When the difference observed between the reference and the alternative methods were above or lower than the 95 % confidence limit of agreement, the tests described in the reference method were applied on the colonies enumerated on the Petrifilm tests. The information concerning the identification and/or confirmation, is provided in Table 5.

Table 5 - Disagreements observed between the reference and the alternative method

Values in green: differences in favor of the alternative method
Values in black: equivalent enumeration observed with both methods
Values in red: differences in favor of the reference method

Corrected value
Results calculated using enumeration lower than 4 CFU/plate

Category	
1	**Meat products**
2	**Dairy products**
3	**Seafood products**
4	**Vegetables**
5	**Miscellaneous and egg-based products**
6	**Feed stuff**
7	**Production environmental samples**

Classification of data	Category	Type	N° Sample	Product	Reference method	Alternative method	Values before correction (Ref/Alt)	Mean	Difference	Lower / Upper limits	Comments	Result before and after confirmation (VRBG/Petrifilm)
Interpretable results by both methods	1	a	210	Poultry meat	2,30	3,23	/	2,76	0,93	-0,43/ 0,87	Colonies confirmed for both methods	2,30-2,30/3,22-3,00
	1	b	212	Brain	2,39	3,34	/	0,95	0,95		Colonies confirmed for both methods	2,39-2,39/3,33-3,33
	1	c	125	Rillettes	1,54	2,46	/	0,92	0,92		Colonies confirmed for both methods	1,54-1,54/2,46-2,46
	1	c	129	Smoked chest	1,00	1,97	/	0,97	0,97		Colonies confirmed for both methods	1,00-1,00/1,97-1,97
	2	a	106b	Cream	6,18	7,29	/	1,12	1,12		Colonies confirmed for both methods	6,18-6,18/7,29-7,25
	2	a	119	Raw milk	3,71	4,89	/	1,18	1,18		Presence of characteristic colonies in VRBG not confirmed, Colonies confirmed for Petrifilm	4,28-3,71/4,89-4,79
	3	a	124	Sardines	1,55	2,70	/	2,12	1,16		Colonies confirmed for both methods	2,28-1,55/2,70-2,14
	3	c	144	Smoked salmon	5,36	4,51	/	4,93	-0,85		Enumeration in favor of the reference method	5,36-5,36/4,51-4,51
	5	b	122	Pastry	2,24	3,66	/	2,95	1,42		Colonies on Petrifilm not confirmed as *Enterobacteria*, lack of specificity of the Petrifilm method	2,24-2,24/3,66-<2,04

Classification of data	Category	Type	N° Sample	Product	Reference method	Alternative method	Values before correction (Ref/Alt)	Mean	Difference	Lower / Upper limits	Comments	Result before and after confirmation (VRBG/Petrifilm)
<4 CFU/plate	7	a	**3904**	**Wipe (pastry industry)**	2,00	3,53	/	2,77	1,53		Sample inoculated with *Citrobacter farmeri*, less colonies in VRGB	
< or > the quantification limit	3	a	6160	Raw fish	1,00	3,69	<2,00	2,35	2,69		Characteristic colonies in VRBG plates , oxidase +, colonies from Petrifilm identified as *Aeromonas hydrophila*	3,62-<2,00/3,69-<2,00
	3	a	6161	Raw fish	2,00	4,18	<3,00	3,09	2,18		Characteristic colonies in VRBG plates , oxidase +, colonies from Petrifilm identified as *Aeromonas hydrophila*	4,26-<3,00/4,18-<3,00
	6	c	154	Raw material	3,27	5,47	<4,27	4,37	2,20		Characteristic colonies in VRBG plates , not confirmed	5,38-<4,27/5,47-not tested
	6	c	441	Raw material	0,00	1,30	<0,85	0,65	1,30		Same result with both method	<1,00-<1,00/1,30-not tested
	7	a	**3905**	**Wipe (bechamel sauce)**	1,00	3,17	<2,00	2,09	2,17		Sample inoculated with *Serratia fonticola*, no growth in VRBG	<2,00-<2,00/not tested (inoculation)
	7	b	**3845**	**Process water (peas)**	0,00	2,01	<1,00	1,01	2,01		Sample inoculated with *Escherichia coli*, no growth in VRBG	<2,00-<2,00/not tested (inoculation)
	7	b	4009	Process water (fish industry)	0,00	3,63	<1,00	1,82	3,63		Characteristic colonies in VRBG plates , oxidase +	3,67-<2,00/3,63-not tested

3.1.1.5 Discordant results

The samples are classified in three categories (See Table 6).

Table 6 - Classification of the samples

		Number of samples
		24 h
Interpretable results by both methods	< LCL	1
	> UCL	8
	Total	9
<4 CFU/plate	< LCL	0
	> UCL	1
	Total	1
< or > the quantification limit	< LCL	0
	> UCL	7
	Total	7
Total < LCL		1
Total >UCL		16

For 10 samples, the difference is clearly in favor of the alternative method (confirmatory tests positive or inoculated samples). The best performances of the alternative method could be due to the fact that 3M™ Petrifilm™ *Enterobacteriaceae* Count (EB) uses a cold-water soluble gelling agent while the ISO 21528-2 method uses a melted media maintained at 44-47°C before pouring in the plates, which can have an injury effect on some *Enterobacteria* strains.

For 3 samples (6160, 6161 and 122), the enumeration obtained with the alternative method is higher than the enumeration obtained with the ISO method but the enumerated colonies were not confirmed as *Enterobacteria* using the tests described in the reference method.

For 2 samples (154 and 4009), no test was applied on the colonies enumerated on Petrifilm; it is thus impossible to know if the enumerated colonies were really *Enterobacteria*.

For one sample (144), the enumeration was slightly higher with the reference method.

For one sample (441), the enumerations were similar with both methods (Ref.: < 1.00; Alt.: 1.30).

3.1.1.6 Conclusion

The relative trueness study of the alternative method is satisfying. The 3M™ Petrifilm™ *Enterobacteriaceae* Count Plate method is reliable when compared to the ISO 21528-2 method.

3.1.2 Accuracy profile study

The accuracy profile is a graphical representation of the capacity of measurement of the quantitative method, obtained by combining acceptability intervals and β-expectation tolerance intervals, both reported to different levels of the reference value.

3.1.2.1 Matrices

Seven matrix/strain pairs were tested. A minimum of one type per category and two different batches were selected, using six samples per type. Two samples were contaminated at a low level, two at intermediate level, and two at a high level. For each sample, five replicates (five different test portions) were tested. In the end, thirty samples were tested per matrix type.

The tested categories, types, matrix and inoculated strains are provided in Table 7.

Table 7 - Categories, types and matrices

Category		Type	Matrix	Inoculated strain	Origin	Inoculation level (CFU/g)
1	**Meat products**	b: Pork, beef, veal raw and cooked	Pork pâté	*Enterobacter agglomerans* 135	Pork liver	300 10 000 100 000
2	**Dairy products**	a: Milk and cream	Pasteurized milk	*Hafnia alvei* 130	Raw milk	
3	**Seafood**	c: Raw	Salmon fillet	*Klebsiella oxytoca* 179	RTE	
4	**Vegetables**	a: Fresh and frozen raw products	Green beans	*Escherichia hermani* Ad1457	Spinach	
5	**Miscellaneous and egg-based products**	c: Egg based products	Whole liquid egg	*Serratia liquefaciens* 26	Egg product	
6	**Feed stuff**	b: Cooked or dehydrated products	Pâté for cat	*Citrobacter braakii* Ad833	Beef meat	
7	**Production environmental samples**	b: Process water (Batch 1: zucchini and split peas Batch 2: pilchards)	Process water	*Escherichia coli* 93	Dish	

3.1.2.2 Calculation and interpretation

The raw data are provided in **Appendix 6**. The summary tables (in log CFU/g) and calculations are provided in **Appendix 7**. The statistical results and the accuracy profiles are provided Figure 12.

The calculations were done using the AP Calculation Tool MCS (Clause 6-1-3-3 calculation and interpretation of accuracy profile study) ver 31-07-2018 available on http://standards.iso.org/iso/16140

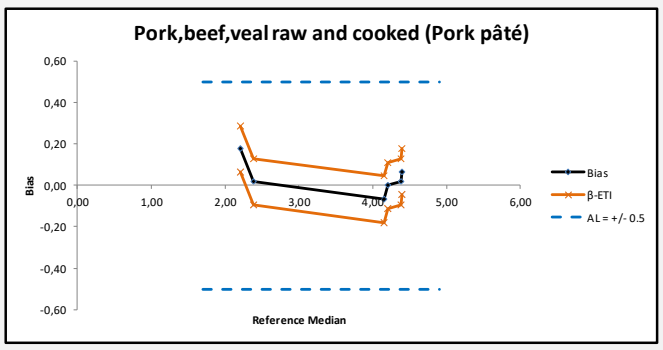
The lower and upper β.ETI are within the acceptability limits for all the matrix/strain pairs tested. The acceptability limits are fixed at + 0.5 log and - 0.5 log for all the matrices tested.

3.1.2.3 Conclusion

The observed profiles are comprised within the AL. All the accuracy profiles fulfill the performance criteria.

Figure 10 – Accuracy profile

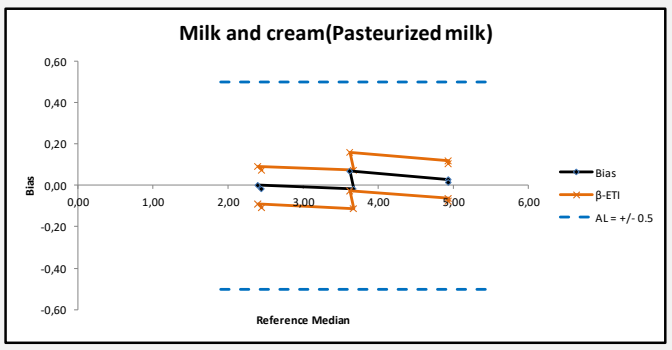
(Food) Category	Meat products
(Food) Type	Pork,beef,veal raw and cooked



Sample Name	Reference central value	Bias	Lower β-ETI	Upper β-ETI	β-ETI compared to AL=±0.5 Acceptable	β-ETI compared to final AL Acceptable
6862-6866	2,20	0,176	0,065	0,287	YES	YES
6867-6871	2,38	0,018	-0,093	0,129	YES	YES
4818-4822	4,15	-0,067	-0,178	0,044	YES	YES
4843-4847	4,20	0,000	-0,111	0,111	YES	YES
4828-4832	4,38	0,018	-0,093	0,129	YES	YES
4853-4857	4,40	0,064	-0,047	0,176	YES	YES

	Reference method	Alternative method	SD repeatability of reference method <= 0.125	Final AL
SD Repeatability	0,074	0,077	YES	+/- 0,500

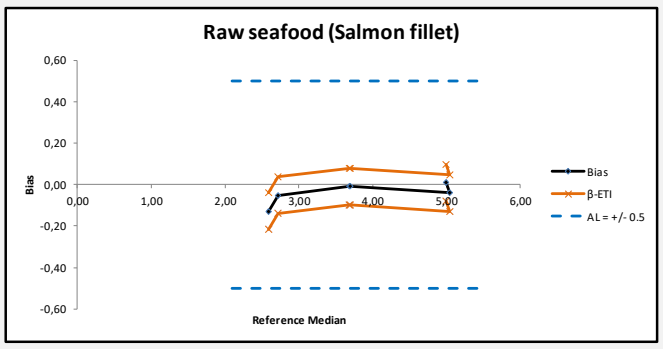
(Food) Category	Dairy products
(Food) Type	Milk and cream(Pasteurized



Sample Name	Reference Central value	Bias	Lower β-ETI	Upper β-ETI	β-ETI compared to AL=±0.5 Acceptable	β-ETI compared to final AL Acceptable
5403-5407	2,45	-0,016	-0,107	0,075	YES	YES
5418-5422	2,40	0,000	-0,091	0,091	YES	YES
5408-5412	3,67	-0,019	-0,110	0,072	YES	YES
5423-5427	3,62	0,067	-0,024	0,158	YES	YES
5413-5417	4,93	0,030	-0,061	0,121	YES	YES
5428-5432	4,93	0,015	-0,076	0,106	YES	YES

	Reference method	Alternative method	SD repeatability of reference method <= 0.125	Final AL
SD Repeatability	0,068	0,063	YES	+/- 0,500

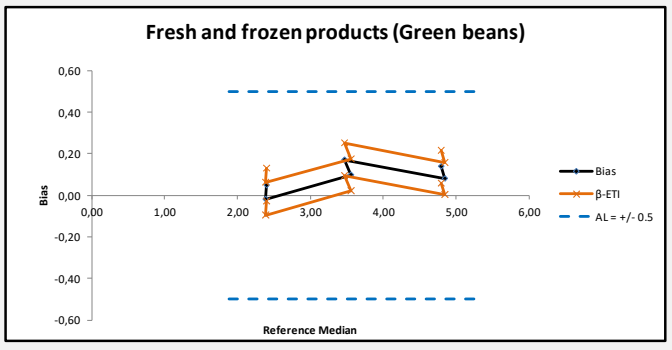
(Food) Category	Seafood
(Food) Type	Raw seafood (Salmon fillet)



Sample Name	Reference Central value	Bias	Lower β-ETI	Upper β-ETI	β-ETI compared to AL=±0.5 Acceptable	β-ETI compared to final AL Acceptable
5626-5630	2,59	-0,129	-0,217	-0,041	YES	YES
5824-5828	2,72	-0,053	-0,141	0,035	YES	YES
5631-5635	3,68	-0,009	-0,097	0,079	YES	YES
5829-5833	3,69	-0,009	-0,097	0,079	YES	YES
5636-5640	5,04	-0,041	-0,129	0,047	YES	YES
5834-5838	4,99	0,009	-0,079	0,097	YES	YES

	Reference method	Alternative method	SD repeatability of reference method <= 0.125	Final AL
SD Repeatability	0,061	0,061	YES	+/- 0,500

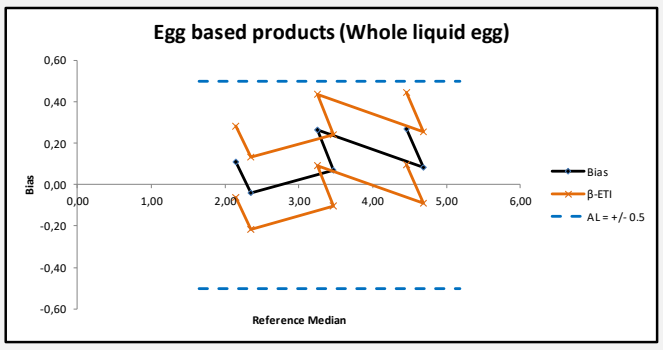
(Food) Category	Vegetables
(Food) Type	Fresh and frozen products



Sample Name	Reference Central value	Bias	Lower β-ETI	Upper β-ETI	β-ETI compared to AL=±0.5 Acceptable	β-ETI compared to final AL Acceptable
4544-4548	2,40	0,049	-0,029	0,127	YES	YES
4559-4563	2,38	-0,018	-0,096	0,059	YES	YES
4549-4553	3,56	0,097	0,019	0,175	YES	YES
4564-4568	3,46	0,171	0,093	0,249	YES	YES
4554-4558	4,84	0,080	0,002	0,158	YES	YES
4569-4573	4,79	0,137	0,059	0,215	YES	YES

	Reference method	Alternative method	SD repeatability of reference method <= 0.125	Final AL
SD Repeatability	0,071	0,054	YES	+/- 0,500

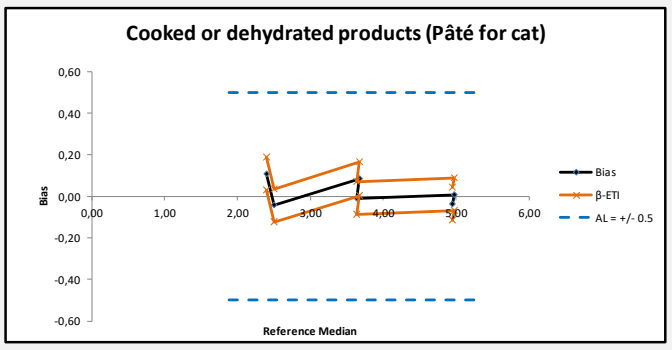
(Food) Category	Miscellaneous and egg products
(Food) Type	Egg based products (Whole



Sample Name	Reference Central value	Bias	Lower β-ETI	Upper β-ETI	β-ETI compared to AL=±0.5 Acceptable	β-ETI compared to final AL Acceptable
6428-6432	2,15	0,109	-0,064	0,282	YES	YES
6857-6861	2,34	-0,041	-0,215	0,132	YES	YES
5093-5097	3,46	0,069	-0,104	0,242	YES	YES
5118-5122	3,26	0,263	0,090	0,436	YES	YES
5103-5107	4,68	0,082	-0,091	0,255	YES	YES
5128-5132	4,46	0,270	0,097	0,443	YES	YES

	Reference method	Alternative method	SD repeatability of reference method <= 0.125	Final AL
SD Repeatability	0,092	0,120	YES	+/- 0,500

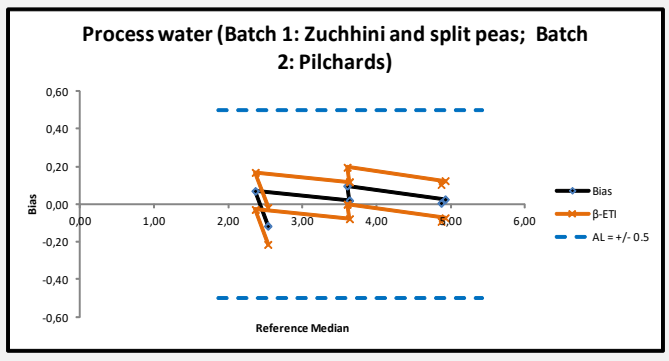
(Food) Category	Feed
(Food) Type	Cooked or dehydrated products



Sample Name	Reference Central value	Bias	Lower β-ETI	Upper β-ETI	β-ETI compared to AL=±0.5 Acceptable	β-ETI compared to final AL Acceptable
4758-4762	2,40	0,107	0,028	0,187	YES	YES
4773-4777	2,51	-0,043	-0,122	0,037	YES	YES
4763-4767	3,67	0,084	0,004	0,163	YES	YES
4778-4782	3,63	-0,010	-0,090	0,069	YES	YES
4768-4772	4,97	0,009	-0,070	0,089	YES	YES
4783-4787	4,94	-0,036	-0,115	0,043	YES	YES

	Reference method	Alternative method	SD repeatability of reference method <= 0.125	Final AL
SD Repeatability	0,079	0,055	YES	+/- 0,500

(Food) Category	Environmental samples
(Food) Type	Process water (Batch 1:



Sample Name	Reference Central value	Bias	Lower β-ETI	Upper β-ETI	β-ETI compared to AL=±0.5 Acceptable	β-ETI compared to final AL Acceptable
5183-5187	2,53	-0,117	-0,215	-0,018	YES	YES
5208-5212	2,36	0,070	-0,029	0,168	YES	YES
5188-5192	3,63	0,020	-0,078	0,118	YES	YES
5213-5217	3,60	0,097	-0,001	0,195	YES	YES
5198-5202	4,92	0,025	-0,073	0,123	YES	YES
5223-5227	4,87	0,006	-0,092	0,104	YES	YES

	Reference method	Alternative method	SD repeatability of reference method <= 0.125	Final AL
SD Repeatability	0,079	0,068	YES	+/- 0,500

3.1.3 Inclusivity and exclusivity studies

The inclusivity study is a study involving pure target strains to be detected or enumerated by the alternative method.
The exclusivity study is a study involving pure non-target strains, which can be potentially cross-reactive, but are not expected to be detected or enumerated by the alternative method.

3.1.3.1 Protocol

- *Inclusivity*

23 target strains were tested for the initial validation study. The study was completed by testing 27 target strains in 2017. Each test was performed once with the alternative method, the reference method and a non-selective agar. The inoculation level shall obtain a countable number on the plate.

- *Exclusivity*

13 non-target strains were tested for the initial validation study. The study was completed by testing 17 strains in 2017. The pure culture was grown in a suitable non-selective broth under optimal growth conditions for at least 24 h and diluted at an appropriate level before testing. Each test was performed once with the alternative method, the reference method and a non-selective agar. The inoculation level shall obtain a countable number on the plate.

3.1.3.2 Results

The raw data are provided in **Appendix 8.**

- *Inclusivity*

Among the 50 strains tested; one strain (*Erwinia carotovora* CIP 103762) did not grow on VRBG and 3M™ Petrifilm plates. The second *Erwinia carotovora* (CIP 8289) grew on 3M™ Petrifilm plates but did not grow on VRBG plates.

- *Exclusivity*

30 strains were tested; 4 strains gave typical colonies by both methods:

- *Aeromonas hydrophila* CIP 5750,
- *Aeromonas bestiarum* CIP 7430,

- *Xanthamonas maltophilia* CIP 6077,
- *Plesiomonas* shigelloïdes Ad673.

3.1.3.3 Conclusion

Similar results were observed with the reference and the alternative methods.

The 3M™ Petrifilm™ *Enterobacteriaceae* Count Plate is specific and selective.

3.1.4 Practicability

The alternative method practicability was evaluated according to the AFNOR criteria.

Criteria to be control	Communication on criteria	Expert lab checking procedure
Storage conditions	Store the unopened 3M Petrifilm pouches at frozen or refrigerated temperature less than or equal to 8°C (46°F)	Mentioned on the instruction for use
Shelf-life and modalities of utilization after first use	Store resealed pouches in a cool dry place for no longer than four weeks	Mentioned in the kit insert
Time to result	24 h ± 2 h	Mentioned in the kit insert
Common step with the reference method		Initial suspensions and dilutions

3.1.5 Method comparison study conclusion

The observed data and interpretation confirm the performances of the alternative method:

- **139 samples were tested in the relative trueness study,** which clearly satisfied the required criteria for quantitative method comparison per ISO 16140-2;

- **The observed profiles are comprised within the AL actually set at ± 0.5 Log CFU/g in the EN ISO 16140-2:2016.**

- **The inclusivity and exclusivity testing shows satisfying results.**

3.2 Inter-Laboratory study

The inter-laboratory study is a study performed by multiple laboratories testing identical samples at the same time, the results of which are used to estimate alternative-method performance parameters.

3.2.1 Study organization

The inter-laboratory stud was run according to the ISO 16140 (2003) in 2001 for the renewal stud. The study was run on pasteurized skimmed milk inoculated with *Escherichia coli* 94.

15 collaborators participated to the study; the results from 14 laboratories were kept for interpretation (late reception for one laboratory).

3.2.2 Analysis results

3.2.2.1 Results obtained by the expert Lab.

The results obtained by the expert Lab. are the following (See table 8).

Table 8 – Results obtained by the expert Lab.

Level	Reference method		Alternative method	
	Rep 1	Rep 2	Rep 1	Rep 2
L0	< 1	< 1	< 1	< 1
L1	2.18	2.26	2.26	2.15
L2	3.18	3.30	3.23	3.20
L3	4.11	4.23	4.08	4.15

3.2.2.2 Results obtained by the collaborators

Samples were sent to 15 collaborators.

A summary of the test results is given in Table 9 (CFU/ml) and Table 10 (log CFU/ml).

Table 9 - Summary of data (CFU/ml)

Collaborator	Level 0				Level 1				Level 2				Level 3			
	Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method	
A	<1	<1	<1	<1	300	260	120	220	1800	1900	2000	2900	21000	15000	17000	27000
B	<1	<1	<1	<1	250	210	260	100	1200	1300	2100	1300	24000	16000	19000	23000
C	<1	<1	<1	<1	180	160	110	150	1700	1500	2100	1200	15000	14000	21000	11000
D	<1	<1	<1	<1	150	140	220	210	1400	1300	1500	2400	13000	13000	14000	14000
E	<1	<1	<1	<1	190	164	150	130	1700	1800	1300	1600	15000	22000	14000	17000
F	<1	<1	<1	<1	140	190	160	140	1900	1700	2100	1800	23000	20000	21000	19000
G	<1	<1	<1	<1	180	240	160	160	2300	2600	2100	2000	12000	15000	13000	12000
I	<1	<1	<1	<1	130	150	140	220	1200	1300	2200	1400	13000	12000	18000	20000
J	<1	<1	<1	<1	130	130	100	160	1300	1400	2100	2200	15000	14000	20000	21000
K	<1	<1	<1	<1	200	290	210	180	2100	2300	1800	1500	17000	14000	27000	14000
L	<1	<1	<1	<1	220	230	190	260	2200	2400	1700	2400	25000	23000	23000	13000
M	<1	<1	<1	<1	160	170	160	100	2000	2700	1400	2700	20000	12000	15000	17000
N	<1	<1	<1	<1	180	280	230	200	1700	1700	1600	1500	14000	11000	22000	16000
O	<1	<1	<1	<1	210	190	210	230	1400	2000	1100	900	16000	7000	9100	9400

Table 10 - Summary of data (log CFU/ml)

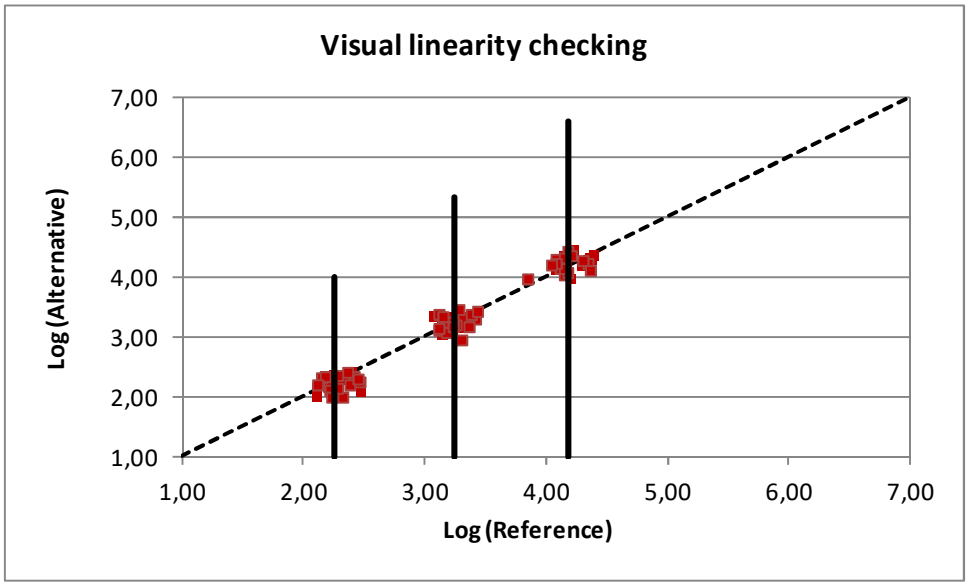
Collaborator	Level 0				Level 1				Level 2				Level 3			
	Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method	
A	<0,00	<0,00	<0,00	<0,00	2,477	2,415	2,079	2,342	3,255	3,279	3,301	3,462	4,322	4,176	4,230	4,431
B	<0,00	<0,00	<0,00	<0,00	2,398	2,322	2,415	2,000	3,079	3,114	3,322	3,114	4,380	4,204	4,279	4,362
C	<0,00	<0,00	<0,00	<0,00	2,255	2,204	2,041	2,176	3,230	3,176	3,322	3,079	4,176	4,146	4,322	4,041
D	<0,00	<0,00	<0,00	<0,00	2,176	2,146	2,342	2,322	3,146	3,114	3,176	3,380	4,114	4,114	4,146	4,146
E	<0,00	<0,00	<0,00	<0,00	2,279	2,215	2,176	2,114	3,230	3,255	3,114	3,204	4,176	4,342	4,146	4,230
F	<0,00	<0,00	<0,00	<0,00	2,146	2,279	2,204	2,146	3,279	3,230	3,322	3,255	4,362	4,301	4,322	4,279
G	<0,00	<0,00	<0,00	<0,00	2,255	2,380	2,204	2,204	3,362	3,415	3,322	3,301	4,079	4,176	4,114	4,079
I	<0,00	<0,00	<0,00	<0,00	2,114	2,176	2,146	2,342	3,079	3,114	3,342	3,146	4,114	4,079	4,255	4,301
J	<0,00	<0,00	<0,00	<0,00	2,114	2,114	2,000	2,204	3,114	3,146	3,322	3,342	4,176	4,146	4,301	4,322
K	<0,00	<0,00	<0,00	<0,00	2,301	2,462	2,322	2,255	3,322	3,362	3,255	3,176	4,230	4,146	4,431	4,146
L	<0,00	<0,00	<0,00	<0,00	2,342	2,362	2,279	2,415	3,342	3,380	3,230	3,380	4,398	4,362	4,362	4,114
M	<0,00	<0,00	<0,00	<0,00	2,204	2,230	2,204	2,000	3,301	3,431	3,146	3,431	4,301	4,079	4,176	4,230
N	<0,00	<0,00	<0,00	<0,00	2,255	2,447	2,362	2,301	3,230	3,230	3,204	3,176	4,146	4,041	4,342	4,204
O	<0,00	<0,00	<0,00	<0,00	2,322	2,279	2,322	2,362	3,146	3,301	3,041	2,954	4,204	3,845	3,959	3,973

3.2.3 Calculations and interpretation

3.2.3.1 Visual linearity checking

The figure 11 shows the data points after $\log_{10}$ transformation. The visual inspection shows that the alternative method gives results, which are proportional to those of the reference method. The data are distributed closely to the first bisecting lines with a slope equal to 1.

Figure 11 - Visual linearity checking



3.2.3.2 Accuracy profile calculations

Statistical calculations were done according to the Excel spreadsheet available on http://standards.iso.org/ISO/16140. A summary of the statistical test is provided in Table 11.

These values are collected in a graphical representation together with the acceptability limits (AL). This representation is given Figure 12

Table 11 - Summary of statistical tests

Accuracy profile	0,5					
Study Name	3M Petrifilm *Enterobacteriaceae*					
Date						
Coordinator				FAUX		
Tolerance probability (beta)	80%	80%	80%			
Acceptability limit in log (lambda)	0,50	0,50	0,50			

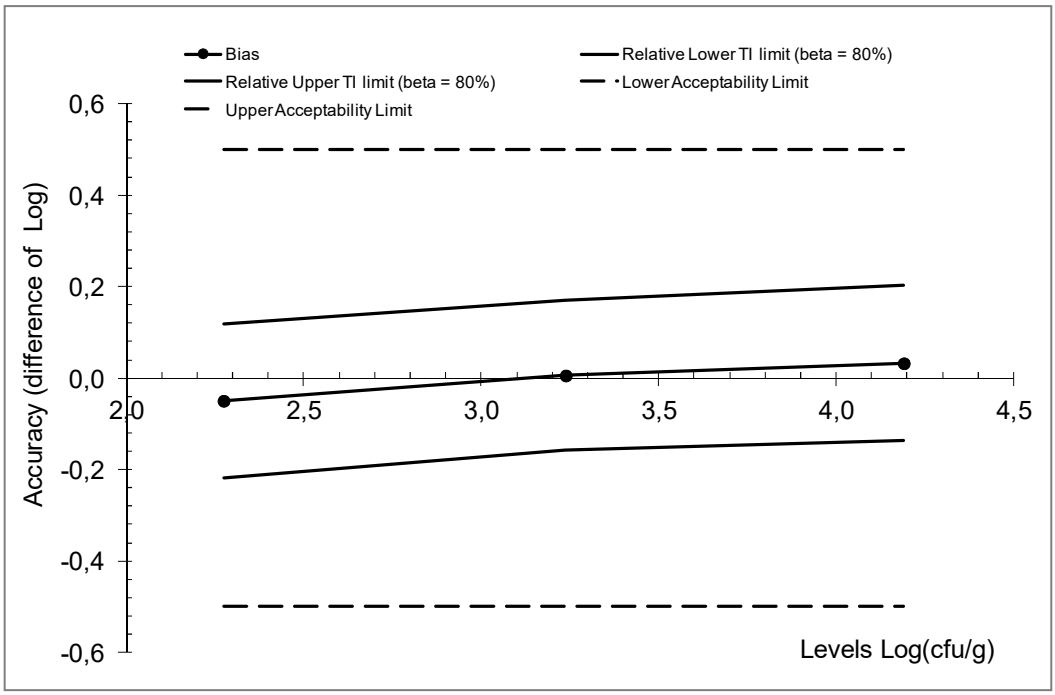
Application of clause 6.2.3
Step 8: If any of the values for the β-ETI fall outside the acceptability limits, calculate the pooled average reproducibility standard deviation of the reference method.
Step 9: Calculate new acceptability limits as a function of this standard deviation.

	Alternative method			**Reference method**		
Levels	**Low**	**Medium**	**High**	**Low**	**Medium**	**High**
Target value	**2,274**	**3,238**	**4,191**			
Number of participants (K)	14	14	14	14	14	14
Average for alternative method	2,224	3,244	4,223	2,274	3,238	4,191
Repeatability standard deviation (sr)	0,122	0,110	0,104	0,065	0,045	0,102
Between-labs standard deviation (sL)	0,031	0,052	0,071	0,088	0,095	0,070
Reproducibility standard deviation (sR)	0,126	0,122	0,126	0,109	0,105	0,124
Corrected number of dof	26,745	25,758	23,978	18,466	15,645	23,988
Coverage factor	1,339	1,343	1,349			
Interpolated Student t	1,314	1,315	1,318			
Tolerance interval standard deviation	0,1283	0,1245	0,1291			
Lower TI limit	2,056	3,080	4,053			
Upper TI limit	2,393	3,408	4,393			
Bias	**-0,050**	**0,006**	**0,032**			
Relative Lower TI limit (beta = 80%)	**-0,218**	**-0,158**	**-0,138**	FAUX		
Relative Upper TI limit (beta = 80%)	**0,119**	**0,169**	**0,203**	FAUX		
Lower Acceptability Limit	**-0,50**	**-0,50**	**-0,50**			
Upper Acceptability Limit	**0,50**	**0,50**	**0,50**			

New acceptability limits may be based on reference method pooled variance

Pooled repro standard dev of reference	0,113

Figure 12 - Accuracy profile



It is observed that for all the levels, the tolerance interval limits of the alternative method are within the acceptable limits of ± 0.5 log.

The alternative method is equivalent to the reference method.

3.3 General conclusion

The **method comparison study conclusions** are:

The observed data and interpretation confirm the performances of the alternative method:

- **171 samples were tested in the relative trueness study providing 144 interpretable results by both the reference and the alternative method,** which clearly satisfied the required criteria for quantitative method comparison per ISO 16140-2;

- **The observed profiles are comprised within the AL actually set at ± 0.5 Log CFU/g in the EN ISO 16140-2:2016.**

- **The inclusivity and exclusivity testing shows satisfying results.**

The **inter-laboratory study conclusions** are:

The data interpretations were done according to the EN ISO 16140-2:2016. For the three contamination levels, the alternative method is accepted as equivalent to the reference method.

Based on the results obtained for the method comparison study and the inter-laboratory study, the 3M™ Petrifilm™ *Enterobacteriaceae* is considered equivalent to the reference method.

Quimper, 22 September 2021

Maryse RANNOU
Project Manager
Validation of Alternative methods
Food Safety & Quality

I hereby attest to the validation of the verification of the conformity of the report (opinion and interpretation).

Appendix 1 – Flow diagram of the alternative method: 3M™ Petrifilm™ *Enterobacteriaceae* Count Plate

xg + 9x ml appropriate diluent

↓

Stomach

↓

Decimal dilutions

↓

1 ml per Petrifilm

↓

Incubation for 24 h ± 2 h at 37°C ± 1°C or at 30°C ± 1°C*

↓

Characteristic colonies enumeration:

- Red-colonies with yellow zones
- Red-colonies with gas bubbles
- Red-colonies with yellow zones and gas bubbles

*During the NF Validation study, the 37°C temperature was used.

Appendix 2 – Flow diagrams of the reference method: NF ISO 21528-2 (June 2017) - Microbiology of food and animal feeding stuffs - Horizontal methods for the detection and enumeration of *Enterobacteriaceae* - Part 2: colony-count method

xg + 9x ml appropriate diluent

↓

Stomach

↓

Decimal dilutions

↓

Inoculate 1 ml per plate

↓

Add VRBG + double layer

↓

Incubation for 24 h ± 2 h at 37°C ± 1°C

↓

Enumeration of characteristic colonies (red, pink, with or without a precipitation halo)

↓

Confirmation: pick up 5 colonies per plate retained for enumeration

↓

TSA incubation for 24 h ± 2 h at 37°C ± 1°C

↙ ↘

Oxidase test
(-)

OF Glucose
(24 h ± 2 h at 37°C ± 1°C)
(Fermentation, +)

Appendix 3 – Artificial contaminations of samples

Date of analyse	Sample number	Product (French name)	Product	Artificial contaminations			
				Strain	Origin	Injury protocol	Injury measurement
2010	**763**	**Saucisson pour chien**	**Sausage for dog**	*Escherichia coli* 12	Turkey meat	TT 30min 55°C	0,66
2010	**765**	**Saucisson pour chien**	**Sausage for dog**	*Escherichia coli* 101	Pork brain	TT 30min 55°C	0,47
2010	**774**	**Mini filets pour chat au lapin**	**Pâté for cat**	*Escherichia coli* Ad233	Veal	-20°C	0,54
2015	**3844**	**Chiffonnette Microcut petits pois**	**Wipe (peas industry)**	*Escherichia coli* 19	Grated carrots	HT 56°C 30min	1,20
2015	**3845**	**Eau de cuisson petits pois**	**Process water (peas)**	*Escherichia coli* 19	Grated carrots	HT 56°C 30min	1,20
2015	**3903**	**Chiffonnette balance après désinfection cuisson riz**	**Wipe (rice industry)**	*Citrobacter farmerii* Ad 1116	Environment	pH4 for 11 days	1,90
2015	**3904**	**Chiffonnette plan de travail fabrication madeleine après désinfection**	**Wipe (pastry industry)**	*Citrobacter farmerii* Ad 1116	Environment	pH4 for 11 days	1,90
2015	**3905**	**Chiffonnette table de cuisson béchamel**	**Wipe (bechamel sauce)**	*Serratia fonticola* Ad 1376	Water	HT 56°C 25 min	3,40
2015	**3906**	**Chiffonnette table découpe Emmenthal**	**Wipe (cheese industry)**	*Escherichia coli* Ad 1395	Water	HT 56°C 25 min	1,44
2015	**3907**	**Eau de rinçage becher (PDL+eau)**	**Process water (milk industry)**	*Serratia fonticola* Ad 1376	Water	HT 56°C 25 min	3,40
2015	**4494**	**Chiffonnette local vaisselle atelier**	**Wipe (dishwasher)**	*Enterobacter fergusonii* 2876	Environment	16 days pH4	0,42
2015	**4495**	**Chiffonnette table atelier**	**Wipe (table)**	*Enterobacter fergusonii* 2876	Environment	16 days pH4	0,42
2015	**4496**	**Chiffonnette cutter**	**Wipe (cutter)**	*Citrobacter youngae* Ad1372	Water	HT 50°C 10 min	0,5
2015	**4497**	**Chiffonnette poussoir**	**Wipe (push-button)**	*Citrobacter youngae* Ad1372	Water	HT 50°C 10 min	0,5
2015	**4562**	**Chiffonnette table préparation pâte**	**Wipe**	*Escherichia coli* Ad1388	Water	16 days pH4	0,42
2015	**4563**	**Chiffonnette cuve broyeur après nettoyage**	**Wipe after cleaning**	*Escherichia coli* 101	Pork meat	16 days 4°C	1,07
2015	**4564**	**Chiffonnette grille four fumage après nettoyage**	**Wipe after cleaning**	*Escherichia coli* Ad1828	Beef meat	HT 50°C 10 min	0,4
2015	**4565**	**Chiffonnette table découpe après nettoyage**	**Wipe after cleaning**	*Escherichia coli* Ad1388	Water	16 days pH4	0,42
2017	**6226**	**Crème dessert à la vanille**	**Dairy dessert**	*Enterobacter kobei* Ad706	Milk powder	Seeding 48h 2-8°C	/
2017	**6227**	**Riz au lait**	**Dairy dessert**	*Enterobacter kobei* Ad706	Milk powder	Seeding 48h 2-8°C	/
2017	**6228**	**Nem au crabe**	**RTRH Seafood**	*Enterobacter cloacae* Ad230	Tuna	Seeding 48h 2-8°C	/
2017	**6229**	**Beignets de crevettes**	**RTRH Seafood**	*Enterobacter cloacae* Ad230	Tuna	Seeding 48h 2-8°C	/
2017	**6230**	**Parmentier de poisson ciboulette**	**RTRH seafood**	*Escherichia coli* Ad228	Fish	Seeding 48h 2-8°C	/

Date of analyse	Sample number	Product (French name)	Product	Artificial contaminations			
				Strain	Origin	Injury protocol	Injury measurement
2017	**6231**	**Betteraves rouges assaisonnées**	**Seasoned red beetroot**	*Escherichia hermanii* Ad457	Spinach	Seeding 48h 2-8°C	/
2017	**6232**	**Carottes râpées au citron**	**Seasoned grated carrots**	*Escherichia hermanii* Ad457	Spinach	Seeding 48h 2-8°C	/
2017	**6233**	**Duo carottes céleri assaisonnés**	**Seasoned grated celery carrots**	*Klebsiella pneumoniae* 139	Soya	Seeding 48h 2-8°C	/
2017	**6234**	**Boulettes aux légumes carottes petits pois mais**	**RTRH beef**	*Escherichia hermanii* Ad457	Spinach	Seeding 48h 2-8°C	/
2017	**6235**	**Boulettes aux légumes carottes petits pois mais**	**RTRH beef**	*Klebsiella pneumoniae* 139	Soya	Seeding 48h 2-8°C	/
2017	**6236**	**Galettes gourmandes lentilles carottes**	**RTRH vegetables**	*Klebsiella pneumoniae* 139	Soya	Seeding 48h 2-8°C	/
2017	**6237**	**Falafels pois chiches fèves coriandre menthe**	**RTRH vegetables**	*Klebsiella pneumoniae* 139	Soya	Seeding 48h 2-8°C	/
2017	**6238**	**Cannelloni pur bœuf**	**RTRH beef**	*Enterobacter kobei* Ad342	Ham	Seeding 48h 2-8°C	/
2017	**6239**	**Pizza jambon fromage**	**RTRH pizza**	*Enterobacter kobei* Ad342	Ham	Seeding 48h 2-8°C	/
2017	**6240**	**Flan pâtissier**	**Custard pastry**	*Escherichia hermanii* Ad461	Custard	Seeding 48h 2-8°C	/
2017	**6241**	**Eclair au chocolat**	**Pastry**	*Escherichia hermanii* Ad461	Custard	Seeding 48h 2-8°C	/
2017	**6242**	**Saucisson pour chien**	**Sausage for dog**	*Enterobacter kobei* Ad342	Ham	Seeding 48h 2-8°C	/
2017	**6243**	**Eau de rinçage (industrie porc)**	**Rinsed water (Pork industry)**	*Hafnia alvei* 167	Sausages	Seeding 48h 2-8°C	/
2017	**6244**	**Eau de lavage sciage viande (industrie porc)**	**Wash water (pork industry)**	*Hafnia alvei* 167	Sausages	Seeding 48h 2-8°C	/
2017	**6884**	**Filet de colin**	**Hake fillet**	*Rhanella aquatilis* 67	Delicatessen	Seeding 48h 2-8°C	/
2017	**6885**	**Filet de cabillaud**	**Cod fillet**	*Rhanella aquatilis* 67	Delicatessen	Seeding 48h 2-8°C	/
2017	**6907**	**Protéines déshydratées de volaille**	**Dehydrated poultry proteins**	*Enterobacter aerogenes* Ad889	Meat meal	Spiking-HT 8 min 56°C	/
2017	**6908**	**Protéines déshydratées de volaille**	**Dehydrated poultry proteins**	*Enterobacter aerogenes* Ad889	Meat meal	Spiking-HT 8 min 56°C	/
2017	**6909**	**Colin d'Alaska**	**Hake**	*Enterobacter cloacae* Ad230	Tuna	Seeding 48h 2-8°C	/
2017	**6910**	**Colin d'Alaska**	**Hake**	*Enterobacter cloacae* Ad230	Tuna	Seeding 48h 2-8°C	/
2017	**6911**	**Saumon**	**Salmon**	*Citrobacter braakii* Ad2701	Squids	Seeding 48h 2-8°C	/
2017	**6912**	**Poudre de lait écrémée**	**Skimmed milk powder**	*Escherichia vulneris* 127	Raw milk	Spiking HT 8min 56°C	0,5
2017	**6913**	**Poudre de lait écrémée**	**Skimmed milk powder**	*Escherichia coli* Ad1422	Infant formula	Spiking HT 8min 56°C	1,0
2017	**6914**	**Poudre de lait infantile sans probiotiques**	**Infant formula without probiotics**	*Escherichia vulneris* 127	Raw milk	Spiking HT 8min 56°C	0,5
2017	**6915**	**Poudre de lait infantile avec probiotiques**	**Infant formula with probiotics**	*Escherichia hermanii* Ad463	Raw milk	Spiking HT 8min 56°C	1,7
2017	**6916**	**Poudre de lait infantile avec probiotiques**	**Infant formula with probiotics**	*Escherichia coli* Ad1422	Infant formula	Spiking HT 8min 56°C	1,0

Appendix 4 - Relative trueness study: raw data

Ne: estimated number *: less than 4 colonies/plate N: arithmetic average Data not available

MEAT PRODUCTS																											
Date of analysis	Sample number	Product (French name)	Product	pH		Reference method: ISO 21528-2♦										Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate										Category	Type
						Dilution	Rep 1 (confirmed)		Rep 2 (confirmed)		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean	Dilution	Rep 1		Rep 2		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean		
				before	after		cfu/ plate a	cfu/ plate b	cfu/ plate a	cfu/ plate b	cfu/g	cfu/g	log cfu/g	log cfu/g			Total cfu/plate	Gaz + cfu/plate	Total cfu/plate	Gaz + cfu/plate	cfu/g	cfu/g	log cfu/g	log cfu/g			
1997	11	Escalope de dinde	Poultry meat										4,03	3,95	3,99								4,02	3,95	3,99	1	a
1997	206	Foie de poulet	Poultry liver										4,19	4,19	4,19								4,5	4,66	4,58	1	a
1997	207	Foie de lapin	Rabbit liver										2,60	2,30	2,45								2,78	3,08	2,93	1	a
1997	210	Pilons de poulet	Poultry meat										2,00	2,60	2,30								3,26	3,19	3,23	1	a
1997	211	Ailes de poulet	Poultry meat										4,62	4,60	4,61								5,13	5,1	5,12	1	a
1997	68	Caille aux raisins	Ready to reheat meat-based product										2,84	2,96	2,90								3,28	3,32	3,30	1	a
1997	113	Gésiers de canard confits	Shredded duck confit										4,75	4,95	4,85								5	4,91	4,96	1	a
1997	50	Steak haché	Ground beef										4,96	4,48	4,72								4,96	4,96	4,96	1	b
1997	116	Minerai	Trimmings										3,90	3,87	3,89								3,95	3,89	3,92	1	b
1997	208	Foie de porc	Pork liver										3,48	3,41	3,45								3,59	3,46	3,53	1	b
1997	212	Cervelle	Brain										2,48	2,30	2,39								3,41	3,26	3,34	1	b
1997	4	Rognons au Madère	Ready to reheat meat-based product										1,30	1,30	1,30								1,48	1,48	1,48	1	b
1997	70	Côte de veau à la crème	Ready to reheat meat-based product										1,00	1,30	1,15								1	1,3	1,15	1	b
1997	101	Bœuf carottes	Ready to reheat meat-based product										4,49	4,49	4,49								4,23	4,26	4,25	1	b
1997	17	Chair à tomates	Sausage										5,90	5,74	5,82								5,87	5,89	5,88	1	c
1997	19	Poitrine demi-sel	Half-salt chest										3,48	3,76	3,62								4	3,94	3,97	1	c
1997	20	Rillettes	Rillettes										4,41	4,28	4,35								4,41	4,66	4,54	1	c
1997	23	Jambon blanc	Ham										2,38	2,40	2,39								2,65	2,71	2,68	1	c
1997	25	Chipolatas	Chipolatas										2,13	1,95	2,04								2,46	2,62	2,54	1	c
1997	48	Chipolatas	Chipolatas										3,21	3,10	3,16								3,15	3,45	3,30	1	c
1997	90	Boudin noir	Black sausage										1,95	1,60	1,78								2	1,9	1,95	1	c
1997	91	Rillettes	Rillettes										4,7	4,64	4,67								4,67	4,57	4,62	1	c
1997	92	Poitrine crue	Raw chest										1,00	1,30	1,15								1,48	1,3	1,39	1	c
1997	121	Chipolatas	Chipolatas										5,76	5,56	5,66								5,76	5,65	5,71	1	c
1997	125	Rillettes	Rillettes										1,60	1,48	1,54								2,19	2,73	2,46	1	c
1997	126	Jambon	Ham										3,90	4,00	3,95								4,05	4,11	4,08	1	c
1997	129	Poitrine fumée	Smoked chest										1,00	1,00	1,00								2,04	1,9	1,97	1	c
1997	130	Boudin noir	Black sausage										2,81	2,72	2,77								3,58	3,41	3,50	1	c
1997	205	Chipolatas	Chipolatas										3,49	3,19	3,34								3,65	3,58	3,62	1	c

♦ Analyses performed according to the COFRAC accreditation

DAIRY PRODUCTS

Date of analysis	Sample number	Product (French name)	Product	pH		Reference method: ISO 21528-2♦										Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate										Category	Type
						Dilution	Rep 1 (confirmed)		Rep 2 (confirmed)		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean	Dilution	Rep 1		Rep 2		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean		
				before	after		cfu/ plate a	cfu/ plate b	cfu/ plate a	cfu/ plate b	cfu/g	cfu/g	log cfu/g	log cfu/g			Total cfu/plate	Gaz + cfu/plate	Total cfu/plate	Gaz + cfu/plate	cfu/g	cfu/g	log cfu/g	log cfu/g			
1997	38	Lait cru	Raw milk										2,74	2,85	2,80								3	2,96	2,98	2	a
1997	106b	Crème fraîche	Cream										6,19	6,16	6,18								7,4	7,18	7,29	2	a
1997	107b	Crème fraîche	Cream										7,41	7,28	7,35								7,46	7,63	7,55	2	a
1997	119	Lait cru	Raw milk										3,91	3,51	3,71								4,82	4,95	4,89	2	a
2017	6159	Lait cru	Raw milk	7,02	/	100	134				14000	/	4,15	/	4,15	100	109	97	/	/	11000	/	4,04	/	4,04	2	a
						1000	18									1000	14	12	/	/							
1997	9	Fromage de chèvre	Goat milk cheese										3,13	3,04	3,09								3,48	3,45	3,47	2	b
1997	10	Tomme de brebis	Ewe milk cheese										4,16	4,30	4,23								4,83	4,8	4,82	2	b
1997	42	Munster	Munster										6,59	6,55	6,57								6,75	6,72	6,74	2	b
1997	75	Fromage de chèvre	Goat milk cheese										2,93	3,01	2,97								2,8	3,19	3,00	2	b
1997	85	Raclette au lait cru	Raw milk cheese										3,08	3,06	3,07								3,39	3,36	3,38	2	b
1997	86	Brie de Meaux au lait cru	Brie de Meaux (raw milk)										7,16	7,21	7,19								7,23	7,28	7,26	2	b
1997	110	Brebis demi-sec	Ewe milk cheese										3,39	3,44	3,42								4,12	4,08	4,10	2	b
1997	111	Tomme Mont d'Arrée	Cheese										5,41	5,41	5,41								5,73	5,81	5,77	2	b
1997	120	Brie	Brie										4,37	4,28	4,33								4,19	4,34	4,27	2	b
1997	128	Vieux pané	Cheese										1,95	2,11	2,03								2,77	2,81	2,79	2	b
1997	131	Livarot	Livarot										2,82	2,87	2,85								3,28	3,19	3,24	2	b
1997	132	Munster	Munster										5,55	5,54	5,55								5,85	5,86	5,86	2	b
1997	201	Camembert	Camembert										7,71	7,82	7,77								7,81	7,88	7,85	2	b
1997	202	Reblochon	Reblochon										7,48	7,46	7,47								7,43	7,3	7,37	2	b
1997	203	Camembert	Camembert										7,19	7,12	7,16								7,23	7,27	7,25	2	b
1997	204	Camembert	Camembert										6,19	6,00	6,10								6,28	6,39	6,34	2	b
1997	140	Nougat glacé	Iced nougat										1,30	1,00	1,15								1,95	1,3	1,63	2	c
1997	141	Nougat glacé	Iced nougat										1,00	1,48	1,24								1,56	1,44	1,50	2	c
1997	142	Nougat glacé	Iced nougat										1,48	1,60	1,54								1,66	1,86	1,76	2	c
2017	**6226**	**Crème dessert à la vanille**	**Dairy dessert**	6,95	/	10	15				140	/	2,15	/	2,15	10	23	23	/	/	210	/	2,32	/	2,32	2	c
						100	0									100	0	0	/	/							
2017	**6227**	**Riz au lait**	**Dairy dessert**	6,98	/	1000	21				21000	/	4,32	/	4,32	1000	63	63	/	/	61000	/	4,79	/	4,79	2	c
						10000	2									100100	4	4	/	/							
2017	**6912**	**Poudre de lait écrémée**	**Skimmed milk powder**	6,87	/	10	13				180	/	2,26	/	2,26	10	65				670	/	2,83	/	2,83	2	c
						100	7									100	9										
2017	**6913**	**Poudre de lait écrémée**	**Skimmed milk powder**	6,80	/	1000	97				97000	/	4,99	/	4,99	1000	147				150000	/	5,18	/	5,18	2	c
						10000	10									10000	18										
2017	**6914**	**Poudre de lait infantile sans probiotiques**	**Infant formula without probiotics**	6,93	/	100	4				400	/	2,60	/	2,60	100	15				1400	/	3,15	/	3,15	2	c
						1000	2						Ne			1000	0										
2017	**6915**	**Poudre de lait infantile avec probiotiques**	**Infant formula with probiotics**	6,86	/	10	116				1200	/	3,08	/	3,08	10	137				1400	/	3,15	/	3,15	2	c
						100	12									100	13										
2017	**6916**	**Poudre de lait infantile avec probiotiques**	**Infant formula with probiotics**	6,89	/	1000	60				65000	/	4,81	/	4,81	1000	62				65000	/	4,81	/	4,81	2	c

♦ Analyses performed according to the COFRAC accreditation

SEAFOOD

Date of analysis	Sample number	Product (French name)	Product	pH		Reference method: ISO 21528-2♦										Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate										Category	Type
						Dilution	Rep 1 (confirmed)		Rep 2 (confirmed)		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean	Dilution	Rep 1		Rep 2		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean		
				before	after		cfu/ plate a	cfu/ plate b	cfu/ plate a	cfu/ plate b	cfu/g	cfu/g	log cfu/g	log cfu/g			Total cfu/plate	Gaz + cfu/plate	Total cfu/plate	Gaz + cfu/plate	cfu/g	cfu/g	log cfu/g	log cfu/g			
1997	124	Sardines	Sardines										1,58	1,51	1,55								2,67	2,73	2,70	3	a
1997	163	Maquereau	Mackerel										3,04	2,73	2,89								3,02	2,98	3,00	3	a
2017	6160	Lieu noir cru	Raw fish	7,06	/	100	Positive oxidase- A.hydrophila /V.fluvialis				<100	/	<2,00	/	<2,00	100	51	8	/	/	4900	/	3,69	/	3,69	3	a
						1000	Positive oxidase- A.hydrophila/ V.fluvialis									1000	3	2	/	/							
2017	6161	Darne de saumon cru	Raw fish	7,05	/	1000	Positive oxidase- A.hydrophila/ V.fluvialis				<1000	/	<3,00	/	<3,00	1000	16	4	/	/	15000	/	4,18	/	4,18	3	a
						10000	Positive oxidase- A.hydrophila/ V.fluvialis									10000	1	0	/	/							
2017	6162	Filet de saumon surgelé	Frozen salmon	6,93	/	10	73				750	/	2,88	/	2,88	10	65	46	/	/	640	/	2,81	/	2,81	3	a
						100	9									100	5	2	/	/							
2017	**6884**	**Filet de colin**	**Hake fillet**	7,01	/	10	0				<10	/	<1,00	/	<1,00	10	0	0			<10	/	<1,00	/	<1,00	3	a
						100	0									100	0	0									
2017	**6885**	**Filet de cabillaud**	**Cod fillet**	7,03	/	100	0				<10	/	<1,00	/	<1,00	100	0	0			<10	/	<1,00	/	<1,00	3	a
						1000	0									1000	0	0									
2017	**6909**	**Colin d'Alaska**	**Hake**	6,91	/	10	36				360	/	2,56	/	2,56	10	66				640	/	2,81	/	2,81	3	a
						100	3									100	4										
2017	**6910**	**Colin d'Alaska**	**Hake**	6,95	/	100	56				5400	/	3,73	/	3,73	100	87				8300	/	3,92	/	3,92	3	a
						1000	3									1000	4										
2017	**6911**	**Saumon**	**Salmon**	6,80	/	1000	74				76000	/	4,88	/	4,88	1000	97				100000	/	5,00	/	5,00	3	a
						10000	10									10000	16										
1997	88	Cocktail de fruits de mer	Precooked seafood										1,60	1,70	1,65								1,7	1,78	1,74	3	b
1997	36	Moules	Mussels										1,30	1,30	1,30								1,84	1,6	1,72	3	b
2017	**6228**	**Nem au crabe**	**RTRH Seafood**	6,90	/	100	27				2500	/	3,40	/	3,40	100	34	34	/	/	3500	/	3,54	/	3,54	3	b
						1000	1									1000	4	4	/	/							
2017	**6229**	**Beignets de crevettes**	**RTRH Seafood**	6,82	/	1000	9				10000	/	4,00	/	4,00	1000	24	24	/	/	25000	/	4,40	/	4,40	3	b
						10000	2									10000	3	3	/	/							
2017	**6230**	**Parmentier de poisson ciboulette**	**RTRH seafood**	6,79	/	1000	108				110000	/	5,04	/	5,04	1000	91	91	/	/	92000	/	4,96	/	4,96	3	b
						10000	11									10000	10	10	/	/							
1997	60	Feuilleté fruits de mer	Ready to reheat seafood product										4,49	4,46	4,48								4,39	4,39	4,39	3	c
1997	62	Coquille à la bretonne	Ready to reheat seafood product										1,00	1,30	1,15								1	1,48	1,24	3	c
1997	67	Filet de julienne en sauce	Ready to reheat seafood product										2,85	2,58	2,72								2,53	2,76	2,65	3	c
1997	73	Saumon fumé	Smoked salmon										3,56	3,34	3,45								3,6	3,49	3,55	3	c
1997	105b	Saumon fumé	Smoked salmon										5,26	5,00	5,13								5,28	5,39	5,34	3	c
1997	144	Saumon fumé	Smoked salmon										5,26	5,45	5,36								4,54	4,48	4,51	3	c

♦ Analyses performed according to the COFRAC accreditation

VEGETABLES

Date of analysis	Sample number	Product (French name)	Product	pH		Reference method: ISO 21528-2♦										Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate										Category	Type
						Dilution	Rep 1 (confirmed)		Rep 2 (confirmed)		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean	Dilution	Rep 1		Rep 2		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean		
				before	after		cfu/ plate a	cfu/ plate b	cfu/ plate a	cfu/ plate b	cfu/g	cfu/g	log cfu/g	log cfu/g			Total cfu/plate	Gaz + cfu/plate	Total cfu/plate	Gaz + cfu/plate	cfu/g	cfu/g	log cfu/g	log cfu/g			
1997	39	Courgette	Zucchini										1,30	1,84	1,57								2	1,7	1,85	4	a
1997	81	Chou rouge râpé	Grated red cabbage										2,20	2,15	2,18								2,51	2,56	2,54	4	a
1997	154	Brocolis surgelés	Frozen broccolis										1,48	1,90	1,69								1,7	1,7	1,70	4	a
1997	155	Brocolis surgelés	Frozen broccolis										1,85	1,90	1,88								1,7	1,6	1,65	4	a
1997	156	Brocolis surgelés	Frozen broccolis										2,58	2,54	2,56								3,09	3,06	3,08	4	a
1997	159	Carottes surgelées	Frozen carrots										3,18	3,18	3,18								3,61	3,48	3,55	4	a
1997	160	Tomates surgelées	Frozen tomatoes										2,00	1,95	1,98								2,34	2,41	2,38	4	a
1997	161	Tomates surgelées	Frozen tomatoes										2,44	2,42	2,43								2,9	2,86	2,88	4	a
1997	162	Pommes de terre surgelées	Frozen potatoes										1,78	1,90	1,84								2,08	2,04	2,06	4	a
1997	82	Céleri râpé	Grated celery										3,08	3,04	3,06								2,62	2,83	2,73	4	b
1997	102	Salade primavera	Salad										3,67	3,61	3,64								3,74	3,79	3,77	4	b
2017	**6231**	**Betteraves rouges assaisonnées**	**Seasoned red beetroot**	6,81	/	10	26				270	/	2,43	/	2,43	10	22	22	/	/	250	/	2,40	/	2,40	4	b
						100	4									100	5	5	/	/							
2017	**6232**	**Carottes râpées au citron**	**Seasoned grated carrots**	6,78	/	10	41				440	/	2,64	/	2,64	10	38	0	/	/	360	/	2,56	/	2,56	4	b
						100	7									100	2	0	/	/							
2017	**6233**	**Duo carottes céleri assaisonnés**	**Seasoned grated celery carrots**	6,75	/	10	16				160	/	2,20	/	2,20	10	15	15	/	/	170	/	2,23	/	2,23	4	
						100	2									100	4	4	/	/							
1997	35	Pomme de terre	Potatoes										4,53	3,81	4,17								4,72	4,8	4,76	4	c
2017	**6234**	**Boulettes aux légumes carottes petits pois mais**	**RTRH beef**	7,00	/	100	62				6000	/	3,78	/	3,78	100	67	67	/	/	6500	/	3,81	/	3,81	4	c
						1000	4									1000	4	4	/	/						4	c
2017	**6235**	**Boulettes aux légumes carottes petits pois mais**	**RTRH beef**	7,00	/	10	24				230	/	2,36	/	2,36	10	21	21	/	/	210	/	2,32	/	2,32	4	c
						100	1									100	2	2	/	/							
2017	**6236**	**Galettes gourmandes lentilles carottes**	**RTRH vegetables**	6,97	/	10	62				640	/	2,81	/	2,81	10	73	73	/	/	740	/	2,87	/	2,87	4	c
						100	8									100	8	8	/	/							
2017	**6237**	**Fallafels pois chiches fèves coriandre menthe**	**RTRH vegetables**	6,80	/	100	90				9200	/	3,96	/	3,96	100	98	98	/	/	9700	/	3,99	/	3,99	4	c
						1000	11									1000	9	9	/	/							

♦ Analyses performed according to the COFRAC accreditation

MISCELLANEOUS AND EGG-BASED PRODUCTS

Date of analysis	Sample number	Product (French name)	Product	pH		Reference method: ISO 21528-2♦										Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate										Category	Type
						Dilution	Rep 1 (confirmed)		Rep 2 (confirmed)		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean	Dilution	Rep 1		Rep 2		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean		
				before	after		cfu/ plate a	cfu/ plate b	cfu/ plate a	cfu/ plate b	cfu/g	cfu/g	log cfu/g	log cfu/g			Total cfu/plate	Gaz + cfu/plate	Total cfu/plate	Gaz + cfu/plate	cfu/g	cfu/g	log cfu/g	log cfu/g			
1997	54	Bouchée à la reine	Ready to reheat meat-based product										3,28	3,37	3,33								3,26	3,07	3,17	5	a
1997	64	Croque-monsieur	Croque-monsieur										3,57	3,78	3,68								3,75	3,8	3,78	5	a
1997	117	Raviolis	Raviolis										2	2	2,00								2,78	2,78	2,78	5	a
2017	**6238**	**Cannelloni pur bœuf**	**RTRH beef**	7,05	/	10	55				560	/	2,75	/	2,75	10	67	67	/	/	680	/	2,83	/	2,83	5	a
						100	7									100	8	8	/	/							
2017	**6239**	**Pizza jambon fromage**	**RTRH pizza**	7,03	/	100	48				5000	/	3,70	/	3,70	100	57	57	/	/	6100	/	3,79	/	3,79	5	a
						1000	7									1000	10	10	/	/							
1997	122	Eclair vanille	Pastry										2,48	2	2,24								3,66	3,66	3,66	5	b
1997	78	Chocolats	Chocolates										1,78	1,48	1,63								2,26	2,23	2,25	5	b
1997	118	Chou chantilly	Pastry										4,34	4,48	4,41								4,51	4,62	4,57	5	b
2017	**6240**	**Flan pâtissier**	**Custard pastry**	7,10	/	1000	10				10000	/	4,00	/	4,00	1000	10	10	/	/	11000	/	4,04	/	4,04	5	b
						10000	1									10000	2	2	/	/							
2017	**6241**	**Eclair au chocolat**	**Pastry**	7,11	/	1000	22				23000	/	4,36	/	4,36	1000	28	28	/	/	26000	/	4,41	/	4,41	5	b
						10000	3									10000	1	1	/	/							
1997	29	Crème pâtissière	Custard										1	1,3	1,15								1,95	1,84	1,90	5	c
1997	56	Œuf en gelée	Egg in jelly										2,89	2,89	2,89								2,78	2,91	2,85	5	c
1997	58	Mayonnaise	Mayonnaise										2,71	2,86	2,79								2,3	2,39	2,35	5	c
1997	84	Crème pâtissière	Custard										1,78	1,7	1,74								2,13	1,84	1,99	5	c
1997	104	Mayonnaise	Mayonnaise										3,15	3,21	3,18								3,76	3,8	3,78	5	c
1997	112	Coule d'œuf	Whole egg										4,48	4,54	4,51								4,49	4,44	4,47	5	c

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FEED PRODUCTS

Date of analysis	Sample number	Product (French name)	Product	pH before	pH after	Reference method: ISO 21528-2♦ Dilution	Rep 1 (confirmed) cfu/ plate a	Rep 1 (confirmed) cfu/ plate b	Rep 2 (confirmed) cfu/ plate a	Rep 2 (confirmed) cfu/ plate b	Rep 1 cfu/g	Rep 2 cfu/g	Rep 1 log cfu/g	Rep 2 log cfu/g	Log cfu/g Mean	Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate Dilution	Rep 1 Total cfu/plate	Rep 1 Gaz + cfu/plate	Rep 2 Total cfu/plate	Rep 2 Gaz + cfu/plate	Rep 1 cfu/g	Rep 2 cfu/g	Rep 1 log cfu/g	Rep 2 log cfu/g	Log cfu/g Mean	Category	Type
2010	150	Viande bovine hachée pour animaux	Beef meat for animals			1000	44	66	48	54	53000	50000	4,72	4,70	4,71	10000	5	5	9	7	45000	82000	4,65	4,91	4,78	6	a
						10000	5	1	6	2						100000	0	0	0	0	Ne	Ne	Ne	Ne	Ne		
2010	151	Viande bovine pour animaux en morceaux	Beef meat for animals			100	>150	>150	>150	>150	25000	26000	4,40	4,41	4,41	100	>100	77	>100	81	36000	31000	4,56	4,49	4,52	6	a
						1000	20	30	23	28	N'	N'	N'	N'		1000	36	17	31	17	N'	N'	N'	N'	N'		
2010	152	Viande bovine pour animaux	Beef meat for animals			100	>150	>150	>150	>150	49000	27000	4,69	4,43	4,56	100	Unreadable				22000	35000	4,34	4,54	4,44	6	a
						1000	57	41	22	32	N'	N'	N'	N'		1000	22	16	35	26	N'	N'	N'	N'	N'		
2010	153	Abats frais pour animaux	Fresh offal for animals			1000	15	18	23	13	17000	17000	4,23	4,23	4,23	1000	41	15	20	8	38000	19000	4,58	4,28	4,43	6	a
						10000	2	2	1	0						10000	1	0	1	1							
2010	657	Flanchet sans os pour animaux	Beef meat for animals			1000	>150	>150	>150	>150	850000	1100000	5,93	6,04	5,99	1000	>100	>100	>100	>100	660000	840000	5,82	5,92	5,87	6	a
						10000	87	82	>150	110		N'		N'		10000	66	36	84	53	N'	N'	N'	N'	N'		
2010	659	Cous de volaille pour animaux	Poultry neck for animals			1000	>150	>150	>150	>150	620000	520000	5,79	5,72	5,75	1000	>100	>100	>100	>100	650000	710000	5,81	5,85	5,83	6	a
						10000	83	41	41	63	N'	N'	N'	N'		10000	65	12	71	20	N'	N'	N'	N'	N'		
2010	440	Brisures de riz pour chien	Broken rice for dog			100	>150	117	>150	>150	12000	19000	4,08	4,28	4,18	100	94	0	>150	0	9500	26000	3,98	4,41	4,20	6	b
						1000	24	5	14	24		N'		N'		1000	11	0	26	0		N'		N'	N'		
2010	**763**	**Saucisson pour chien**	**Sausage for dog**			10	4	6	6	4	50	50	1,70	1,70	1,70	10	6	6	4	4	55	45	1,74	1,65	1,70	6	b
						100	0	0	0	0						100	0	0	1	1	Ne	Ne	Ne	Ne	Ne		
2010	**765**	**Saucisson pour chien**	**Sausage for dog**			10	61	61	44	52	600	480	2,78	2,68	2,73	10	56	56	61	61	540	590	2,73	2,77	2,75	6	b
						100	4	6	4	5						100	3	3	4	4							
2010	**774**	**Mini filets pour chat au lapin**	**Pâté for cat**			10	56	52	49	42	510	470	2,71	2,67	2,69	10	55	55	70	70	560	680	2,75	2,83	2,79	6	b
						100	1	2	7	6						100	7	7	5	5							
2017	**6242**	**Saucisson pour chien**	**Sausage for dog**	6,60	6,93	100	24				2300	/	3,36	/	3,36	100	26	26	/	/	2700	/	3,43	/	3,43	6	b
						1000	1									1000	4	4	/	/							
2010	154	Matières premières pour alimentation animale	Raw material			1000	>150	>150	>150	>150	<10000	35000	<4,00	4,54	<4,27	1000	>100	1	>100	0	260000	340000	5,41	5,53	5,47	6	c
						10000	0	0	0	7		N'		N'		10000	26	0	34	0	N'	N'	N'	N'	N'		
2010	155	Matières premières pour alimentation animale	Raw material			100	54	52	23	0	5300	1100	3,72	3,04	3,38	100	59	0	89	0	6000	8800	3,78	3,94	3,86	6	c
						1000	4	7	1	1						1000	7	0	8	0							
2010	441	Matières premières pour alimentation animale	Raw material			10	0	1	0	0	<5	<10	0,70*	<1,00	<0,85	10	1	1	4	4	10	40	1,00	1,60	1,30*	6	c
						100	0	0	0	0						100	0	0	0	0		Ne		Ne			
2010	661	Matières premières pour alimentation animale	Raw material			10	7	13	14	12	95	140	1,98	2,15	2,06	10	17	15	14	12	160	140	2,20	2,15	2,18	6	c
						100	1	0	3	2						100	0	0	1	1							
2010	662	Matières premières pour alimentation animale	Raw material			1000	134	140	>150	143	130000	140000	5,11	5,15	5,13	1000	111	0	132	0	120000	121000	5,08	5,08	5,08	6	c
						10000	10	11	15	10						10000	16	0	1	1							
2017	6163	Protéines déshydratées de volaille	Poultry proteins dehydrated	6,76	/	10	0				<10	/	<1,00	/	<1,00	10	0	0	/	/	<10	/	<1,00	/	<1,00	6	c
						100	0									100	0	0	/	/							
2017	6164	Protéines déshydratées de volaille	Poultry proteins dehydrated	6,76	/	10	0				<10	/	<1,00	/	<1,00	10	0	0	/	/	<10	/	<1,00	/	<1,00	6	c
						100	0									100	0	0	/	/							
2017	**6907**	**Protéines déshydratées de volaille**	**Dehydrated poultry proteins**	6,71	/	100	>150				62000	/	4,79	/	4,79	100	>100	>100			73000	/	4,86	/	4,86	6	c
						1000	62						N'		N'	1000	73	73					N'		N'		
2017	**6908**	**Protéines déshydratées de volaille**	**Dehydrated poultry proteins**	6,83	/	1000	>150				800000	/	5,90	/	5,90	1000	>100	>100			950000	/	5,98	/	5,98	6	c
						10000	80						N'		N'	10000	95	95					N'		N'		

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ENVIRONMENTAL SAMPLES

Date of analysis	Sample number	Product (French name)	Product	pH before	pH after	Reference method: ISO 21528-2♦ Dilution	Rep 1 (confirmed) cfu/ plate a	Rep 1 (confirmed) cfu/ plate b	Rep 2 (confirmed) cfu/ plate a	Rep 2 (confirmed) cfu/ plate b	Rep 1 cfu/g	Rep 2 cfu/g	Rep 1 log cfu/g	Rep 2 log cfu/g	Log cfu/g Mean	Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate Dilution	Rep 1 Total cfu/plate	Rep 1 Gaz + cfu/plate	Rep 2 Total cfu/plate	Rep 2 Gaz + cfu/plate	Rep 1 cfu/g	Rep 2 cfu/g	Rep 1 log cfu/g	Rep 2 log cfu/g	Log cfu/g Mean	Category	Type
2015	**3844**	**Chiffonnette Microcut petits pois**	**Wipe (peas industry)**	7,00	/	10	2	/	2	/	20	20	1,30*	1,30*	1,30*	10	13	/	14	/	130	150	2,11	2,18	2,15	7	a
						100	0	/	0	/						100	1	/	2	/							
2015	**3903**	**Chiffonnette balance après désinfection cuisson riz**	**Wipe (rice industry)**	7,20	/	10	6	/	13	/	60	120	1,78	2,08	1,93	10	56	/	47	/	600	500	2,78	2,70	2,74	7	a
						100	0	/	0	/			Ne			100	10	/	8	/							
2015	**3904**	**Chiffonnette plan de travail fabrication madeleine après désinfection**	**Wipe (pastry industry)**	7,16	/	100	1	/	1	/	100	100	2,00*	2,00*	2,00*	100	31	/	40	/	2900	4000	3,46	3,60	3,53	7	a
						1000	0	/	0	/						1000	1	/	4	/							
2015	**3905**	**Chiffonnette table de cuisson béchamel**	**Wipe (bechamel sauce)**	7,00	/	100	0	/	0	/	<100	<100	<2,00	<2,00	<2,00	100	21	/	12	/	2000	1100	3,30	3,04	3,17	7	a
						1000	0	/	0	/						1000	1	/	0	/							
2015	**3906**	**Chiffonnette table découpe emmenthal**	**Wipe (cheese industry)**	6,97	/	10	0	/	1	/	<10	10	<1,00	1,00*	<1,00	10	1	/	0	/	10	<10	1,00* Detection	<1,00	<1,00	7	a
						100	0	/	0	/						100	0	/	0	/							
2015	4011	Ecouvillon tapis entrée peleuse après désinfection	Swab after cleaning (fish industry)	7,08	/	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	7	a a
						100	0	/	0	/						100	0	/	0	/							
2015	4012	Ecouvillon tapis diviseur après désinfection	Swab after cleaning (fish industry)	7,06	/	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	7	a
						100	0	/	0	/						100	0	/	0	/							
2015	4013	Lingette tapis parage après désinfection	Wipe after cleaning (fish industry)	7,19	/	10	>150	/	>150	/	>15000	12000	>4,18	4,08	>4,13	10	>100	/	>100	/	>10000	>10000	>4,00	>4,00	>4,00	7	a
						100	>150	/	124	/						100	>100	/	>100	/							
2015	4014	Lingette maille sortie parage après désinfection	Wipe after cleaning (fish industry)	7,19	/	10	>150	/	>150	/	3800	4800	3,58	3,68	3,63	10	>100	/	>100	/	4800	4800	3,68	3,68	3,68	7	a
						100	38	/	48	/						100	48	/	48	/							
2015	4015	Lingette tapis parage après désinfection	Wipe after cleaning (fish industry)	7,18	/	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	7	a
						100	0	/	0	/						100	0	/	0	/							
2015	**4494**	**Chiffonnette local vaisselle atelier**	**Wipe (dishwasher)**	7,01	/	10	>1500	/	>1500	/	>15000	>15000	>4,18	>4,18	>4,18	10	>1000	/	>1000	/	>10000	>10000	>4,00	>4,00	>4,00	7	a
						100	>15000	/	>15000	/						100	>10000	/	>10000	/							
2015	**4495**	**Chiffonnette table atelier**	**Wipe (table)**	6,97	/	10	>1500	/	>1500	/	>15000	>15000	>4,18	>4,18	>4,18	10	>1000	/	>1000	/	>10000	>10000	>4,00	>4,00	>4,00	7	a
						100	>15000	/	>15000	/						100	>10000	/	>10000	/							
2015	**4496**	**Chiffonnette cutter**	**Wipe (cutter)**	7,00	/	10	>1500	/	>1500	/	>15000	>15000	>4,18	>4,18	>4,18	10	>1000	/	>1000	/	>10000	>10000	>4,00	>4,00	>4,00	7	a
						100	>15000	/	>15000	/						100	>10000	/	>10000	/							
2015	**4497**	**Chiffonnette poussoir**	**Wipe (push-button)**	7,03	/	100	>15000	/	>15000	/	>150000	>150000	>5,18	>5,18	>5,18	100	>10000	/	>10000	/	>100000	>100000	>5,00	>5,00	>5,00	7	a
						1000	>150000	/	>150000	/						1000	>100000	/	>100000	/							
2015	**4562**	**Chiffonnette table préparation pâte**	**Wipe**	6,92	/	10	11	/	8	/	120	80	2,08	1,90	1,99	10	29	/	24	/	270	250	2,43	2,40	2,41	7	a
						100	2	/	1	/				Ne		100	1	/	3	/							
2015	**4563**	**Chiffonnette cuve broyeur après nettoyage**	**Wipe after cleaning**	7,05	/	10	71	/	61	/	670	610	2,83	2,79	2,81	10	123	/	132	/	1200	1300	3,08	3,11	3,10	7	a
						100	3	/	6	/						100	13	/	15	/							
2015	**4564**	**Chiffonnette grille four fumage après nettoyage**	**Wipe after cleaning**	6,94	/	10	36	/	29	/	330	270	2,52	2,43	2,47	10	15	/	23	/	140	220	2,15	2,34	2,24	7	a
						100	0	/	1	/						100	0	/	1	/							
2015	**4565**	**Chiffonnette table découpe après nettoyage**	**Wipe after cleaning**	6,91	/	10	22	/	26	/	220	240	2,34	2,38	2,36	10	46	/	46	/	460	440	2,66	2,64	2,65	7	a
						100	2	/	0	/						100	5	/	2	/							
2015	3841	Eau de rinçage n°2 petits pois après cuisson	Process water (peas)	7,01	/	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	7	b
						100	0	/	0	/						100	0	/	0	/							
2015	**3845**	**Eau de cuisson petits pois**	**Process water (peas)**	7,00	/	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	10	8	/	13	/	80	130	1,90 Ne	2,11	2,01	7	b
						100	0	/	0	/						100	0	/	1	/							
2015	**3907**	**Eau de rinçage bécher (PDL+eau)**	**Process water (milk industry)**	6,98	/	100	0	/	0	/	<100	<100	<2,00	<2,00	<2,00	100	1	/	0	/	100	<100	2,00*	<2,00	<2,00	7	b
						1000	0	/	0	/						1000	0	/	0	/							

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ENVIRONMENTAL SAMPLES

Date of analysis	Sample number	Product (French name)	Product	pH		Reference method: ISO 21528-2♦										Alternative method : 3M™ Petrifilm *Enterobacteriaceae* Count Plate										Category	Type
						Dilution	Rep 1 (confirmed)		Rep 2 (confirmed)		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean	Dilution	Rep 1		Rep 2		Rep 1	Rep 2	Rep 1	Rep 2	Log cfu/g Mean		
				before	after		cfu/ plate a	cfu/ plate b	cfu/ plate a	cfu/ plate b	cfu/g	cfu/g	log cfu/g	log cfu/g			Total cfu/plate	Gaz + cfu/plate	Total cfu/plate	Gaz + cfu/plate	cfu/g	cfu/g	log cfu/g	log cfu/g			
2015	4006	Eau dessalage	Process water (fish industry)	6,95	/	10	25	/	11	/	230	100	2,36	2,00	2,18	10	20	/	22	/	180	200	2,26	2,30	2,28	7	b
						100	0	/	0	/						100	0	/	0	/							
2015	4007	Eau peleuse	Process water (fish industry)	7,20	/	1	0	/	0	/	<1	<1	<0,00	<0,00	<0,00	1	0	/	0	/	<1	<1	<0,00	<0,00	<0,00	7	b
						10	0	/	0	/						10	0	/	0	/							
2015	4008	Eau pareuse	Process water (fish industry)	7,14	/	10	>150	/	>150	/	5500	11000	3,74	4,04	3,89	10	>100	/	>100	/	3500	3300	3,54	3,52	3,53	7	b
						100	55	/	106	/						100	35	/	33	/							
2015	4009	Eau laveuse poissons	Process water (fish industry)	7,12	/	10	(>150)	/	(>150)	/	<2,00	<2,00	<2,00	<2,00	<2,00	10	>100	/	>100	/	3200	5600	3,51	3,75	3,63	7	b
						100	0 (ox+)	/	0	/						100	32	/	56	/							
2015	4010	Eau épineuse	Process water (fish industry)	7,20	/	10	>150	/	>150	/	2800	1300	3,45	3,11	3,28	10	78	/	98	/	860	1000	2,93	3,00	2,97	7	b
						100	28	/	13	/						100	17	/	14	/							
2017	**6243**	**Eau de rinçage (industrie porc)**	**Rinsed water (Pork industry)**	7,01	/	10	35				340	/	2,53	/	2,53	10	38	38	/	/	360	/	2,56	/	2,56	7	b
						100	2									100	1	1	/	/							
2017	**6244**	**Eau de lavage sciage viande (porc industrie)**	**Wash water (pork industry)**	7,03	/	1000	33				32000	/	4,51	/	4,51	1000	67	67	/	/	64000	/	4,81	/	4,81	7	b
						10000	2									10000	3	3	/	/							
2015	3676	Poussières industrie ovoproduits	Dusts from egg industry	6,76	/	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	7	c
						100	0	/	0	/						100	0	/	0	/							
2015	3677	Poussières d'aspirateur (atelier)	Dusts	6,93	/	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	10	0	/	0	/	<10	<10	<1,00	<1,00	<1,00	7	c
						100	0	/	0	/						100	0	/	0	/							
2015	3678	Poussières industrie laitière	Dusts from dairy industry	6,36	/	10	5	/	4	/	50	40	1,70	1,60	1,65	10	11	/	13	/	110	130	2,04	2,11	2,08	7	c
						100	0	/	0	/			Ne	Ne		100	1	/	1	/							
2015	3679	Poussières industrie laitière	Dusts from dairy industry	6,48	/	100	32	/	26	/	3500	3700	3,54	3,57	3,56	1000	9	/	9	/	9000	9000	3,95	3,95	3,95	7	c
						1000	6	/	4	/						10000	1	/	1	/			Ne	Ne			
2017	6165	Déchets au sol découpe porc n°1	Dusts n°1 (pork industry)	7,17	/	10	9				90	/	1,95	/	1,95	10	17	12	/	/	160	/	2,20	/	2,20	7	c
						100	1				Ne					100	0	0	/	/							
2017	6166	Déchets au sol découpe porc n°2	Dusts n°2 (pork industry)	7,14	/	1000	21				19000	/	4,28	/	4,28	1000	24	0	/	/	25000	/	4,40	/	4,40	7	c
						10000	0									10000	4	0	/	/							
2017	6167	Déchets au sol découpe porc n°3	Dusts n°3 (pork industry)	7,16	/	10	35				330	/	2,52	/	2,52	10	36	0	/	/	340	/	2,53	/	2,53	7	c
						100	1									100	1	1	/	/							

Appendix 5 - Relative trueness study: summarized results and calculations

Category	Type	N°sample	Incubation : 22 h									
			Log cfu/g		Mean	Difference	Alternative method		Average <4 CFU/ plate	Difference <4 CFU/ plate	Average corrected values	Difference Corrected values
			Reference method	Alternative method			<4 CFU/ plate	<or> threshold corrected values				
1	a	11	3,99	3,99	3,99	-0,01			#N/A		#N/A	
	a	206	4,19	4,58	4,39	0,39			#N/A		#N/A	
	a	207	2,45	2,93	2,69	0,48			#N/A		#N/A	
	a	210	2,30	3,23	2,76	0,93			#N/A		#N/A	
	a	211	4,61	5,12	4,86	0,51			#N/A		#N/A	
	a	68	2,90	3,30	3,10	0,40			#N/A		#N/A	
	a	113	4,85	4,96	4,90	0,11			#N/A		#N/A	
	b	50	4,72	4,96	4,84	0,24			#N/A		#N/A	
	b	116	3,89	3,92	3,90	0,04			#N/A		#N/A	
	b	208	3,45	3,53	3,49	0,08			#N/A		#N/A	
	b	212	2,39	3,34	2,86	0,95			#N/A		#N/A	
	b	4	1,30	1,48	1,39	0,18			#N/A		#N/A	
	b	70	1,15	1,15	1,15	0,00			#N/A		#N/A	
	b	101	4,49	4,25	4,37	-0,25			#N/A		#N/A	
	c	17	5,82	5,88	5,85	0,06			#N/A		#N/A	
	c	19	3,62	3,97	3,80	0,35			#N/A		#N/A	
	c	20	4,35	4,54	4,44	0,19			#N/A		#N/A	
	c	23	2,39	2,68	2,54	0,29			#N/A		#N/A	
	c	25	2,04	2,54	2,29	0,50			#N/A		#N/A	
	c	48	3,16	3,30	3,23	0,15			#N/A		#N/A	
	c	90	1,78	1,95	1,86	0,18			#N/A		#N/A	
	c	91	4,67	4,62	4,65	-0,05			#N/A		#N/A	
	c	92	1,15	1,39	1,27	0,24			#N/A		#N/A	
	c	121	5,66	5,71	5,68	0,04			#N/A		#N/A	
	c	125	1,54	2,46	2,00	0,92			#N/A		#N/A	
	c	126	3,95	4,08	4,02	0,13			#N/A		#N/A	
	c	129	1,00	1,97	1,49	0,97			#N/A		#N/A	
	c	130	2,77	3,50	3,13	0,73			#N/A		#N/A	
	c	205	3,34	3,62	3,48	0,28			#N/A		#N/A	
Average category 1						**0,31**						
Standard deviation of differences category 1						**0,32**						
2	a	38	2,80	2,98	2,89	0,19			#N/A		#N/A	
	a	106b	6,18	7,29	6,73	1,12			#N/A		#N/A	
	a	107b	7,35	7,55	7,45	0,20			#N/A		#N/A	
	a	119	3,71	4,89	4,30	1,18			#N/A		#N/A	
	a	6159	4,15	4,04	4,09	-0,10			#N/A		#N/A	
	b	9	3,09	3,47	3,28	0,38			#N/A		#N/A	
	b	10	4,23	4,82	4,52	0,58			#N/A		#N/A	
	b	42	6,57	6,74	6,65	0,16			#N/A		#N/A	
	b	75	2,97	3,00	2,98	0,03			#N/A		#N/A	
	b	85	3,07	3,38	3,22	0,31			#N/A		#N/A	
	b	86	7,19	7,26	7,22	0,07			#N/A		#N/A	
	b	110	3,42	4,10	3,76	0,69			#N/A		#N/A	
	b	111	5,41	5,77	5,59	0,36			#N/A		#N/A	
	b	120	4,33	4,27	4,30	-0,06			#N/A		#N/A	
	b	128	2,03	2,79	2,41	0,76			#N/A		#N/A	
	b	131	2,85	3,24	3,04	0,39			#N/A		#N/A	
	b	132	5,55	5,86	5,70	0,31			#N/A		#N/A	
	b	201	7,77	7,85	7,81	0,08			#N/A		#N/A	
	b	202	7,47	7,37	7,42	-0,11			#N/A		#N/A	
	b	203	7,16	7,25	7,20	0,09			#N/A		#N/A	
	b	204	6,10	6,34	6,22	0,24			#N/A		#N/A	
	c	140	1,15	1,63	1,39	0,48			#N/A		#N/A	
	c	141	1,24	1,50	1,37	0,26			#N/A		#N/A	
	c	142	1,54	1,76	1,65	0,22			#N/A		#N/A	
	c	**6226**	2,15	2,32	2,23	0,18			#N/A		#N/A	
	c	**6227**	4,32	4,79	4,55	0,46			#N/A		#N/A	
	c	**6912**	2,26	2,83	2,54	0,57			#N/A		#N/A	
	c	**6913**	4,99	5,18	5,08	0,19			#N/A		#N/A	
	c	**6914**	2,60	3,15	2,87	0,54			#N/A		#N/A	
	c	**6915**	3,08	3,15	3,11	0,07			#N/A		#N/A	
	c	**6916**	4,81	4,81	4,81	0,00			#N/A		#N/A	
Average category 2						**0,32**						
Standard deviation of differences category 2						**0,31**						
3	a	124	1,55	2,70	2,12	1,16			#N/A		#N/A	
	a	163	2,89	3,00	2,94	0,12			#N/A		#N/A	
	a	6160	1,00		#N/A			3,69	#N/A		2,35	2,69
	a	6161	2,00		#N/A			4,18	#N/A		3,09	2,18
	a	6162	2,88	2,81	2,84	-0,07			#N/A		#N/A	
	a	**6884**	0,00		#N/A			0,00	#N/A		0,00	0,00
	a	**6885**	0,00		#N/A			0,00	#N/A		0,00	0,00
	a	**6909**	2,56	2,81	2,68	0,25			#N/A		#N/A	
	a	**6910**	3,73	3,92	3,83	0,19			#N/A		#N/A	
	a	**6911**	4,88	5,00	4,94	0,12			#N/A		#N/A	
	b	88	1,65	1,74	1,70	0,09			#N/A		#N/A	
	b	36	1,30	1,72	1,51	0,42			#N/A		#N/A	
	b	**6228**	3,40	3,54	3,47	0,15			#N/A		#N/A	
	b	**6229**	4,00	4,40	4,20	0,40			#N/A		#N/A	
	b	**6230**	5,04	4,96	5,00	-0,08			#N/A		#N/A	
	c	60	4,48	4,39	4,43	-0,09			#N/A		#N/A	
	c	62	1,15	1,24	1,20	0,09			#N/A		#N/A	
	c	67	2,72	2,65	2,68	-0,07			#N/A		#N/A	
	c	73	3,45	3,55	3,50	0,09			#N/A		#N/A	
	c	105b	5,13	5,34	5,23	0,21			#N/A		#N/A	
	c	144	5,36	4,51	4,93	-0,85			#N/A		#N/A	
Average category 3						**0,12**						
Standard deviation of differences category 3						**0,38**						

Category	Type	N°sample	Incubation : 22 h									
			Log cfu/g		Mean	Difference	Alternative method		Average <4 CFU/ plate	Difference <4 CFU/ plate	Average corrected values	Difference Corrected values
			Reference method	Alternative method			<4 CFU/ plate	<or> threshold corrected values				
4	a	39	1,57	1,85	1,71	0,28			#N/A		#N/A	
	a	81	2,18	2,54	2,36	0,36			#N/A		#N/A	
	a	154	1,69	1,70	1,70	0,01			#N/A		#N/A	
	a	155	1,88	1,65	1,76	-0,23			#N/A		#N/A	
	a	156	2,56	3,08	2,82	0,52			#N/A		#N/A	
	a	159	3,18	3,55	3,36	0,37			#N/A		#N/A	
	a	160	1,98	2,38	2,18	0,40			#N/A		#N/A	
	a	161	2,43	2,88	2,66	0,45			#N/A		#N/A	
	a	162	1,84	2,06	1,95	0,22			#N/A		#N/A	
	b	82	3,06	2,73	2,89	-0,34			#N/A		#N/A	
	b	102	3,64	3,77	3,70	0,13			#N/A		#N/A	
	b	**6231**	2,43	2,40	2,41	-0,03			#N/A		#N/A	
	b	**6232**	2,64	2,56	2,60	-0,09			#N/A		#N/A	
	b	**6233**	2,20	2,23	2,22	0,03			#N/A		#N/A	
	c	35	4,17	4,76	4,47	0,59			#N/A		#N/A	
	c	**6234**	3,78	3,81	3,80	0,03			#N/A		#N/A	
	c	**6235**	2,36	2,32	2,34	-0,04			#N/A		#N/A	
	c	**6236**	2,81	2,87	2,84	0,06			#N/A		#N/A	
	c	**6237**	3,96	3,99	3,98	0,02			#N/A		#N/A	
Average category 4						**0,14**						
Standard deviation of differences category 4						**0,25**						
5	a	54	3,33	3,17	3,25	-0,16			#N/A		#N/A	
	a	64	3,68	3,78	3,73	0,10			#N/A		#N/A	
	a	117	2,00	2,78	2,39	0,78			#N/A		#N/A	
	a	**6238**	2,75	2,83	2,79	0,08			#N/A		#N/A	
	a	**6239**	3,70	3,79	3,74	0,09			#N/A		#N/A	
	b	122	2,24	3,66	2,95	1,42			#N/A		#N/A	
	b	78	1,63	2,25	1,94	0,62			#N/A		#N/A	
	b	118	4,41	4,57	4,49	0,15			#N/A		#N/A	
	b	**6240**	4,00	4,04	4,02	0,04			#N/A		#N/A	
	b	**6241**	4,36	4,41	4,39	0,05			#N/A		#N/A	
	c	29	1,15	1,90	1,52	0,75			#N/A		#N/A	
	c	56	2,89	2,85	2,87	-0,05			#N/A		#N/A	
	c	58	2,79	2,35	2,57	-0,44			#N/A		#N/A	
	c	84	1,74	1,99	1,86	0,25			#N/A		#N/A	
	c	104	3,18	3,78	3,48	0,60			#N/A		#N/A	
	c	112	4,51	4,47	4,49	-0,04			#N/A		#N/A	
Average category 5						**0,26**						
Standard deviation of differences category 5						**0,46**						
6	a	150	4,71	4,78	4,75	0,07			#N/A		#N/A	
	a	151	4,41	4,52	4,47	0,12			#N/A		#N/A	
	a	152	4,56	4,44	4,50	-0,12			#N/A		#N/A	
	a	153	4,23	4,43	4,33	0,20			#N/A		#N/A	
	a	657	5,99	5,87	5,93	-0,11			#N/A		#N/A	
	a	659	5,75	5,83	5,79	0,08			#N/A		#N/A	
	b	440	4,18	4,20	4,19	0,02			#N/A		#N/A	
	b	**763**	1,70	1,70	1,70	0,00			#N/A		#N/A	
	b	**765**	2,73	2,75	2,74	0,02			#N/A		#N/A	
	b	**774**	2,69	2,79	2,74	0,10			#N/A		#N/A	
	b	**6242**	3,36	3,43	3,40	0,07			#N/A		#N/A	
	c	154	3,27		#N/A			5,47	#N/A		4,37	2,20
	c	155	3,38	3,86	3,62	0,48			#N/A		#N/A	
	c	441	0,00		#N/A			1,30	#N/A		0,65	1,30
	c	661	2,06	2,18	2,12	0,11			#N/A		#N/A	
	c	662	5,13	5,08	5,11	-0,05			#N/A		#N/A	
	c	6163	0,00		#N/A			0,00	#N/A		0,00	0,00
	c	6164	0,00		#N/A			0,00	#N/A		0,00	0,00
	c	**6907**	4,79	4,86	4,83	0,07			#N/A		#N/A	
	c	**6908**	5,90	5,98	5,94	0,07			#N/A		#N/A	
Average category 6						**0,07**						
Standard deviation of differences category 6						**0,14**						

Category	Type	N°sample	Incubation : 22 h									
			Log cfu/g		Mean	Difference	Alternative method		Average <4 CFU/ plate	Difference <4 CFU/ plate	Average corrected values	Difference Corrected values
			Reference method	Alternative method			<4 CFU/ plate	<or> threshold corrected values				
4	a	39	1,57	1,85	1,71	0,28			#N/A		#N/A	
	a	81	2,18	2,54	2,36	0,36			#N/A		#N/A	
	a	154	1,69	1,70	1,70	0,01			#N/A		#N/A	
	a	155	1,88	1,65	1,76	-0,23			#N/A		#N/A	
	a	156	2,56	3,08	2,82	0,52			#N/A		#N/A	
	a	159	3,18	3,55	3,36	0,37			#N/A		#N/A	
	a	160	1,98	2,38	2,18	0,40			#N/A		#N/A	
	a	161	2,43	2,88	2,66	0,45			#N/A		#N/A	
	a	162	1,84	2,06	1,95	0,22			#N/A		#N/A	
	b	82	3,06	2,73	2,89	-0,34			#N/A		#N/A	
	b	102	3,64	3,77	3,70	0,13			#N/A		#N/A	
	b	**6231**	2,43	2,40	2,41	-0,03			#N/A		#N/A	
	b	**6232**	2,64	2,56	2,60	-0,09			#N/A		#N/A	
	b	**6233**	2,20	2,23	2,22	0,03			#N/A		#N/A	
	c	35	4,17	4,76	4,47	0,59			#N/A		#N/A	
	c	**6234**	3,78	3,81	3,80	0,03			#N/A		#N/A	
	c	**6235**	2,36	2,32	2,34	-0,04			#N/A		#N/A	
	c	**6236**	2,81	2,87	2,84	0,06			#N/A		#N/A	
	c	**6237**	3,96	3,99	3,98	0,02			#N/A		#N/A	
Average category 4						**0,14**						
Standard deviation of differences category 4						**0,25**						
5	a	54	3,33	3,17	3,25	-0,16			#N/A		#N/A	
	a	64	3,68	3,78	3,73	0,10			#N/A		#N/A	
	a	117	2,00	2,78	2,39	0,78			#N/A		#N/A	
	a	**6238**	2,75	2,83	2,79	0,08			#N/A		#N/A	
	a	**6239**	3,70	3,79	3,74	0,09			#N/A		#N/A	
	b	122	2,24	3,66	2,95	1,42			#N/A		#N/A	
	b	78	1,63	2,25	1,94	0,62			#N/A		#N/A	
	b	118	4,41	4,57	4,49	0,15			#N/A		#N/A	
	b	**6240**	4,00	4,04	4,02	0,04			#N/A		#N/A	
	b	**6241**	4,36	4,41	4,39	0,05			#N/A		#N/A	
	c	29	1,15	1,90	1,52	0,75			#N/A		#N/A	
	c	56	2,89	2,85	2,87	-0,05			#N/A		#N/A	
	c	58	2,79	2,35	2,57	-0,44			#N/A		#N/A	
	c	84	1,74	1,99	1,86	0,25			#N/A		#N/A	
	c	104	3,18	3,78	3,48	0,60			#N/A		#N/A	
	c	112	4,51	4,47	4,49	-0,04			#N/A		#N/A	
Average category 5						**0,26**						
Standard deviation of differences category 5						**0,46**						
6	a	150	4,71	4,78	4,75	0,07			#N/A		#N/A	
	a	151	4,41	4,52	4,47	0,12			#N/A		#N/A	
	a	152	4,56	4,44	4,50	-0,12			#N/A		#N/A	
	a	153	4,23	4,43	4,33	0,20			#N/A		#N/A	
	a	657	5,99	5,87	5,93	-0,11			#N/A		#N/A	
	a	659	5,75	5,83	5,79	0,08			#N/A		#N/A	
	b	440	4,18	4,20	4,19	0,02			#N/A		#N/A	
	b	**763**	1,70	1,70	1,70	0,00			#N/A		#N/A	
	b	**765**	2,73	2,75	2,74	0,02			#N/A		#N/A	
	b	**774**	2,69	2,79	2,74	0,10			#N/A		#N/A	
	b	**6242**	3,36	3,43	3,40	0,07			#N/A		#N/A	
	c	154	3,27		#N/A			5,47	#N/A		4,37	2,20
	c	155	3,38	3,86	3,62	0,48			#N/A		#N/A	
	c	441	0,00		#N/A			1,30	#N/A		0,65	1,30
	c	661	2,06	2,18	2,12	0,11			#N/A		#N/A	
	c	662	5,13	5,08	5,11	-0,05			#N/A		#N/A	
	c	6163	0,00		#N/A			0,00	#N/A		0,00	0,00
	c	6164	0,00		#N/A			0,00	#N/A		0,00	0,00
	c	**6907**	4,79	4,86	4,83	0,07			#N/A		#N/A	
	c	**6908**	5,90	5,98	5,94	0,07			#N/A		#N/A	
Average category 6						**0,07**						
Standard deviation of differences category 6						**0,14**						

Category	Type	N°sample	Incubation : 22 h									
			Log cfu/g		Mean	Difference	Alternative method		Average <4 CFU/ plate	Difference <4 CFU/ plate	Average corrected values	Difference Corrected values
			Reference method	Alternative method			<4 CFU/ plate	<or> threshold corrected values				
7	a	**3844**	1,30		#N/A		2,15		1,72	0,85	#N/A	
	a	**3903**	1,93	2,74	2,33	0,81			#N/A		#N/A	
	a	**3904**	2,00		#N/A		3,53		3,07	1,53	#N/A	
	a	**3905**	1,00		#N/A			3,17	#N/A		2,09	2,17
	a	**3906**	0,00		#N/A			0,00	#N/A		0,00	0,00
	a	4011	0,00		#N/A			0,00	#N/A		0,00	0,00
	a	4012	0,00		#N/A			0,00	#N/A		0,00	0,00
	a	4013	5,13		#N/A			5,13	#N/A		5,13	0,00
	a	4014	3,63	3,68	3,66	0,05			#N/A		#N/A	
	a	4015	0,00		#N/A			0,00	#N/A		0,00	0,00
	a	**4494**	5,18		#N/A			5,00	#N/A		5,09	-0,18
	a	**4495**	5,18		#N/A			5,00	#N/A		5,09	-0,18
	a	**4496**	5,18		#N/A			5,00	#N/A		5,09	-0,18
	a	**4497**	5,18		#N/A			5,00	#N/A		5,09	-0,18
	a	**4562**	1,99	2,41	2,20	0,42			#N/A		#N/A	
	a	**4563**	2,81	3,10	2,95	0,29			#N/A		#N/A	
	a	**4564**	2,47	2,24	2,36	-0,23			#N/A		#N/A	
	a	**4565**	2,36	2,65	2,51	0,29			#N/A		#N/A	
	b	3841	0,00		#N/A			0,00	#N/A		0,00	0,00
	b	**3845**	0,00		#N/A			2,01	#N/A		1,00	2,01
	b	**3907**	1,00		#N/A			1,00	#N/A		1,00	0,00
	b	4006	2,18	2,28	2,23	0,10			#N/A		#N/A	
	b	4007	0,00		#N/A			0,00	#N/A		0,00	0,00
	b	4008	3,89	3,53	3,71	-0,36			#N/A		#N/A	
	b	4009	1,00		#N/A			3,63	#N/A		2,31	2,63
	b	4010	3,28	2,97	3,12	-0,31			#N/A		#N/A	
	b	**6243**	2,53	2,56	2,54	0,02			#N/A		#N/A	
	b	**6244**	4,51	4,81	4,66	0,30			#N/A		#N/A	
	c	3676	0,00		#N/A			0,00	#N/A		0,00	0,00
	c	3677	0,00		#N/A			0,00	#N/A		0,00	0,00
	c	3678	1,65	2,08	1,86	0,43			#N/A		#N/A	
	c	3679	3,56	3,95	3,76	0,40			#N/A		#N/A	
	c	6165	1,95	2,20	2,08	0,25			#N/A		#N/A	
	c	6166	4,28	4,40	4,34	0,12			#N/A		#N/A	
	c	6167	2,52	2,53	2,52	0,01			#N/A		#N/A	
Average category 7						**0,16**						
Standard deviation of differences category 7						**0,30**						
Average all categories				Dall		**0,22**						
Standard deviation of differences all categories				SDAll		**0,33**						

	n all	144				
β=95%	T(0,05;70)=	1,976692167				
		0,652338902	Upper limit	Lower limit	Linear	
	Average (minimal value)	**0,00**	0,87	-0,43		0,22
	Average (maximal value)	**10,00**	0,87	-0,43		0,22

Category	n	T(0,05;70)=	SD	ISO formula	Bias	Lower limit (95%)	Upper limit (95%)
1	29	2,05	0,32	0,68	0,31	-0,36	0,99
2	39	2,02	0,31	0,65	0,32	-0,33	0,96
3	22	2,08	0,38	0,82	0,12	-0,69	0,94
4	22	2,08	0,25	0,54	0,14	-0,40	0,69
5	16	2,13	0,46	1,00	0,46	-0,55	1,46
6	16	2,13	0,14	0,30	0,07	-0,23	0,37
7	16	2,13	0,30	0,67	0,16	-0,51	0,83
All categories	**144**	**1,98**	**0,33**	**0,65**	**0,22**	**-0,43**	**0,87**

Appendix 6 - Accuracy profile study: raw data

N': arithmetic average

Matrix	Strain	Level	N° sample	Reference method : ISO 21528-2♦				Alternative method: 3M™ Petrifilm *Enterobacteriaceae* 24h ± 2h at 37°C ± 1°C			
				Dilution	cfu/plate	cfu/g	log cfu/g	Dilution	cfu/Petrifilm test	cfu/g)	log cfu/g
Pork pâté Batch 1 Aerobic mesophilic flora: 20 CFU/g	*Enterobacter agglomerans* 135	1	6862	10	14	140	2,15	10	24	240	2,38
				100	1			100	2		
			6863	10	16	160	2,20	10	22	230	2,36
				100	2			100	3		
			6864	10	15	140	2,15	10	27	280	2,45
				100	0			100	4		
			6865	10	16	170	2,23	10	30	320	2,51
				100	3			100	5		
			6866	10	24	260	2,41	10	25	240	2,38
				100	4			100	1		
		2	4818	100	136	14000	4,15	100	135	12000	4,08
				1000	16			1000	12		N'
			4819	100	111	11000	4,04	100	153	12000	4,08
				1000	13			1000	12		N'
			4820	100	140	14000	4,15	100	150	18000	4,26
				1000	11			1000	18		N'
			4821	100	133	14000	4,15	100	165	15000	4,18
				1000	17			1000	15		N'
			4822	100	112	12000	4,08	100	105	11000	4,04
				1000	15			1000	11		
		3	4828	1000	27	26000	4,41	1000	26	25000	4,40
				10000	2			10000	1		
			4829	1000	26	25000	4,40	1000	28	27000	4,43
				10000	2			10000	2		
			4830	1000	19	18000	4,26	1000	20	20000	4,30
				10000	1			10000	2		
			4831	1000	24	24000	4,38	1000	32	31000	4,49
				10000	2			10000	2		
			4832	1000	22	23000	4,36	1000	22	22000	4,34
				10000	3			10000	2		
Pork pâté Batch 2 Aerobic mesophilic flora: 0 CFU/g		1	6867	10	20	190	2,28	10	25	250	2,40
				100	1			100	2		
			6868	10	33	340	2,53	10	26	250	2,40
				100	4			100	1		
			6869	10	20	200	2,30	10	31	300	2,48
				100	2			100	2		
			6870	10	29	290	2,46	10	30	290	2,46
				100	3			100	2		
			6871	10	21	240	2,38	10	16	160	2,20
				100	5			100	2		
		2	4843	1000	18	18000	4,26	100	178	16000	4,20
				10000	2			1000	16		N'
			4844	1000	13	15000	4,18	100	169	18000	4,26
				10000	3			1000	18		N'
			4845	1000	16	15000	4,18	100	159	11000	4,04
				10000	1			1000	11		N'
			4846	1000	17	17000	4,23	100	178	12000	4,08
				10000	2			1000	12		N'
			4847	1000	16	16000	4,20	100	143	17000	4,23
				10000	2			1000	17		N'
		3	4853	1000	28	29000	4,46	1000	31	33000	4,52
				10000	4			10000	5		
			4854	1000	24	24000	4,38	1000	30	29000	4,46
				10000	2			10000	2		
			4855	1000	25	25000	4,40	1000	27	26000	4,41
				10000	2			10000	2		
			4856	1000	26	25000	4,40	1000	29	32000	4,51
				10000	2			10000	6		
			4857	1000	24	23000	4,36	1000	30	28000	4,45
				10000	1			10000	1		

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	N°sample	Reference method : ISO 21528-2♦				Alternative method: 3M™ Petrifilm *Enterobacteriaceae* 24h ± 2h at 37°C ± 1°C			
				Dilution	cfu/plate	cfu/g	log cfu/g	Dilution	cfu/Petrifilm test	cfu/g	log cfu/g
Pasteurized milk Batch 1 Aerobic mesophilic flora: 0 CFU/g	*Hafnia alvei* 130	1	5403	10	24	240	2,38	10	28	260	2,41
				100	2			100	1		
			5404	10	23	220	2,34	10	24	220	2,34
				100	1			100	0		
			5405	10	34	340	2,53	10	25	270	2,43
				100	3			100	5		
			5406	10	31	310	2,49	10	34	310	2,49
				100	3			100	0		
			5407	10	27	280	2,45	10	33	320	2,51
				100	4			100	2		
		2	5408	100	53	5200	3,72	100	43	4500	3,65
				1000	4			1000	6		
			5409	100	48	4700	3,67	100	49	4900	3,69
				1000	4			1000	5		
			5410	100	41	3700	3,57	100	46	4400	3,64
				1000	0			1000	2		
			5411	100	46	4700	3,67	100	45	4500	3,65
				1000	6			1000	4		
			5412	100	34	3400	3,53	100	36	3600	3,56
				1000	3			1000	4		
		3	5413	1000	104	100000	5,00	1000	90	93000	4,97
				10000	6			10000	12		
			5414	1000	88	85000	4,93	1000	87	86000	4,93
				10000	6			10000	8		
			5415	1000	85	83000	4,92	1000	96	91000	4,96
				10000	6			10000	4		
			5416	1000	88	87000	4,94	1000	81	83000	4,92
				10000	8			10000	10		
			5417	1000	81	77000	4,89	1000	94	95000	4,98
				10000	4			10000	10		
Pasteurized milk Batch 2 Aerobic mesophilic flora: 10 CFU/g		1	5418	10	32	310	2,49	10	28	270	2,43
				100	2			100	2		
			5419	10	28	280	2,45	10	38	360	2,56
				100	3			100	1		
			5420	10	24	240	2,38	10	21	210	2,32
				100	2			100	2		
			5421	10	17	170	2,23	10	27	250	2,40
				100	2			100	0		
			5422	10	22	250	2,40	10	22	210	2,32
				100	5			100	1		
		2	5423	100	52	5100	3,71	100	46	4300	3,63
				1000	4			1000	1		
			5424	100	43	4200	3,62	100	63	6300	3,80
				1000	3			1000	6		
			5425	100	39	3900	3,59	100	50	4900	3,69
				1000	4			1000	4		
			5426	100	41	4000	3,60	100	41	3900	3,59
				1000	3			1000	2		
			5427	100	51	5000	3,70	100	55	5200	3,72
				1000	4			1000	2		
		3	5428	1000	84	82000	4,91	1000	85	85000	4,93
				10000	6			10000	9		
			5429	1000	86	85000	4,93	1000	95	98000	4,99
				10000	7			10000	13		
			5430	1000	91	87000	4,94	1000	89	92000	4,96
				10000	5			10000	12		
			5431	1000	93	97000	4,99	1000	87	88000	4,94
				10000	14			10000	10		
			5432	1000	83	84000	4,92	1000	85	87000	4,94
				10000	9			10000	11		

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	N°sample	Reference method : ISO 21528-2♦				Alternative method: 3M™ Petrifilm *Enterobacteriaceae* 24h ± 2h at 37°C ± 1°C			
				Dilution	cfu/plate	cfu/g	log cfu/g	Dilution	cfu/Petrifilm test	cfu/g	log cfu/g
Frozen salmon fillet Batch 1 Aerobic mesophilic flora: 20 CFU/g	*Klebsiella oxytoca* 179	1	5626	10	39	390	2,59	10	22	240	2,38
				100	4			100	4		
			5627	10	42	430	2,63	10	38	360	2,56
				100	5			100	2		
			5628	10	32	360	2,56	10	26	310	2,49
				100	8			100	8		
			5629	10	42	400	2,60	10	32	290	2,46
				100	2			100	0		
			5630	10	30	300	2,48	10	19	210	2,32
				100	3			100	4		
		2	5631	100	39	4000	3,60	100	35	3500	3,54
				1000	5			1000	3		
			5632	100	60	5600	3,75	100	48	4500	3,65
				1000	2			1000	1		
			5633	100	64	6300	3,80	100	53	5200	3,72
				1000	5			1000	4		
			5634	100	45	4500	3,65	100	48	4700	3,67
				1000	5			1000	4		
			5635	100	49	4800	3,68	100	52	4800	3,68
				1000	4			1000	1		
		3	5636	1000	88	83000	4,92	1000	98	100000	5,00
				10000	3			10000	12		
			5637	1000	110	110000	5,04	1000	104	97000	4,99
				10000	11			10000	3		
			5638	1000	116	110000	5,04	1000	120	120000	5,08
				10000	8			10000	10		
			5639	1000	89	91000	4,96	1000	114	110000	5,04
				10000	11			10000	10		
			5640	1000	110	110000	5,04	1000	92	93000	4,97
				10000	8			10000	10		
Frozen salmon fillet Batch 2 Aerobic mesophilic flora: 50 CFU/g		1	5824	10	53	520	2,72	10	45	460	2,66
				100	4			100	5		
			5825	10	37	360	2,56	10	37	380	2,58
				100	2			100	5		
			5826	10	50	520	2,72	10	51	490	2,69
				100	7			100	3		
			5827	10	45	430	2,63	10	42	410	2,61
				100	2			100	3		
			5828	10	50	520	2,72	10	57	580	2,76
				100	7			100	7		
		2	5829	100	40	3700	3,57	100	54	5500	3,74
				1000	1			1000	7		
			5830	100	51	4800	3,68	100	49	4800	3,68
				1000	2			1000	4		
			5831	100	50	4900	3,69	100	46	4700	3,67
				1000	4			1000	6		
			5832	100	52	5000	3,70	100	55	5300	3,72
				1000	3			1000	3		
			5833	100	54	5100	3,71	100	53	4800	3,68
				1000	2			1000	0		
		3	5834	1000	100	98000	4,99	1000	92	92000	4,96
				10000	8			10000	9		
			5835	1000	107	100000	5,00	1000	99	100000	5,00
				10000	8			10000	12		
			5836	1000	112	110000	5,04	1000	111	110000	5,04
				10000	10			10000	12		
			5837	1000	93	93000	4,97	1000	113	110000	5,04
				10000	9			10000	6		
			5838	1000	93	92000	4,96	1000	89	90000	4,95
				10000	8			10000	10		

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	N°sample	Reference method : ISO 21528-2♦				Alternative method: 3M™ Petrifilm *Enterobacteriaceae* 24h ± 2h at 37°C ± 1°C			
				Dilution	cfu/plate	cfu/g	log cfu/g	Dilution	cfu/Petrifilm test	cfu/g	log cfu/g
Green beans Batch 1 Aerobic mesophilic flora: <10 CFU/g	*Escherichia hermanii* Ad1457	1	4544	10	25	250	2,40	10	35	330	2,52
				100	2			100	1		
			4545	10	26	250	2,40	10	25	240	2,38
				100	1			100	1		
			4546	10	25	230	2,36	10	34	310	2,49
				100	0			100	0		
			4547	10	24	250	2,40	10	28	270	2,43
				100	3			100	2		
			4548	10	25	240	2,38	10	29	280	2,45
				100	1			100	2		
		2	4549	100	25	2600	3,41	100	41	4200	3,62
				1000	4			1000	5		
			4550	100	37	3600	3,56	100	52	5200	3,72
				1000	3			1000	5		
			4551	100	39	3800	3,58	100	45	4300	3,63
				1000	3			1000	2		
			4552	100	32	3300	3,52	100	47	4500	3,65
				1000	4			1000	3		
			4553	100	44	4300	3,63	100	48	4600	3,66
				1000	3			1000	3		
		3	4554	1000	64	60000	4,78	1000	80	74000	4,87
				10000	2			10000	1		
			4555	1000	71	71000	4,85	1000	88	85000	4,93
				10000	7			10000	5		
			4556	1000	79	79000	4,90	1000	89	83000	4,92
				10000	8			10000	2		
			4557	1000	68	69000	4,84	1000	75	72000	4,86
				10000	8			10000	4		
			4558	1000	50	51000	4,71	1000	83	84000	4,92
				10000	6			10000	9		
Green beans Batch 2 Aerobic mesophilic flora: <10 CFU/g		1	4559	10	21	240	2,38	10	26	270	2,43
				100	5			100	4		
			4560	10	14	150	2,18	10	21	210	2,32
				100	2			100	2		
			4561	10	32	310	2,49	10	22	230	2,36
				100	2			100	3		
			4562	10	19	200	2,30	10	33	320	2,51
				100	3			100	2		
			4563	10	24	240	2,38	10	19	200	2,30
				100	2			100	3		
		2	4564	100	34	3300	3,52	100	47	4400	3,64
				1000	2			1000	1		
			4565	100	25	2500	3,40	100	43	4400	3,64
				1000	3			1000	5		
			4566	100	28	2900	3,46	100	43	4300	3,63
				1000	4			1000	4		
			4567	100	32	3300	3,52	100	29	3200	3,51
				1000	4			1000	6		
			4568	100	29	2900	3,46	100	41	4000	3,60
				1000	3			1000	3		
		3	4569	1000	52	51000	4,71	1000	75	77000	4,89
				10000	4			10000	10		
			4570	1000	61	62000	4,79	1000	84	82000	4,91
				10000	7			10000	6		
			4571	1000	56	55000	4,74	1000	87	85000	4,93
				10000	5			10000	7		
			4572	1000	63	63000	4,80	1000	90	95000	4,98
				10000	6			10000	15		
			4573	1000	65	64000	4,81	1000	100	95000	4,98
				10000	5			10000	4		

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	N°sample	Reference method : ISO 21528-2♦				Alternative method: 3M™ Petrifilm *Enterobacteriaceae* 24h ± 2h at 37°C ± 1°C			
				Dilution	cfu/plate	cfu/g	log cfu/g	Dilution	cfu/Petrifilm test	cfu/g	log cfu/g
Whole pasteurized liquid egg Batch 1 Aerobic mesophilic flora: 0 CFU/g	*Serratia liquefaciens* 26	1	6428	10	14	140	2,15	10	23	230	2,36
				100	1			100	2		
			6429	10	15	150	2,18	10	19	180	2,26
				100	1			100	1		
			6430	10	12	110	2,04	10	14	140	2,15
				100	0			100	1		
			6431	10	10	91	1,96	10	21	220	2,34
				100	0			100	3		
			6432	10	15	140	2,15	10	16	160	2,20
				100	0			100	1		
		2	5093	100	27	2700	3,43	100	27	2700	3,43
				1000	3			1000	3		
			5094	100	29	2800	3,45	100	31	3400	3,53
				1000	2			1000	6		
			5095	100	34	3400	3,53	100	36	3600	3,56
				1000	3			1000	4		
			5096	100	30	2900	3,46	100	15	1500	3,18
				1000	2			1000	2		
			5097	100	28	3000	3,48	100	37	3900	3,59
				1000	5			1000	6		
		3	5103	1000	25	28000	4,45	1000	45	44000	4,64
				10000	6			10000	3		
			5104	1000	49	48000	4,68	1000	55	60000	4,78
				10000	4			10000	11		
			5105	1000	40	39000	4,59	1000	33	32000	4,51
				10000	3			10000	2		
			5106	1000	56	55000	4,74	1000	53	58000	4,76
				10000	4			10000	11		
			5107	1000	64	66000	4,82	1000	73	75000	4,88
				10000	9			10000	10		
Whole pasteurized liquid egg Batch 2 Aerobic mesophilic flora: 0 CFU/g		1	6857	10	23	220	2,34	10	22	200	2,30
				100	1			100	0		
			6858	10	22	230	2,36	10	16	160	2,20
				100	3			100	1		
			6859	10	27	280	2,45	10	15	150	2,18
				100	4			100	1		
			6860	10	20	190	2,28	10	22	240	2,38
				100	1			100	4		
			6861	10	21	210	2,32	10	29	290	2,46
				100	2			100	3		
		2	5118	100	18	1800	3,26	100	47	4500	3,65
				1000	2			1000	3		
			5119	100	17	1500	3,18	100	30	3300	3,52
				1000	0			1000	6		
			5120	100	18	1600	3,20	100	42	3900	3,59
				1000	0			1000	1		
			5121	100	27	2700	3,43	100	33	3200	3,51
				1000	3			1000	2		
			5122	100	21	1900	3,28	100	31	3100	3,49
				1000	0			1000	3		
		3	5128	1000	29	29000	4,46	1000	69	67000	4,83
				10000	3			10000	5		
			5129	1000	29	29000	4,46	1000	63	62000	4,79
				10000	3			10000	5		
			5130	1000	35	34000	4,53	1000	35	37000	4,57
				10000	2			10000	6		
			5131	1000	40	39000	4,59	1000	51	54000	4,73
				10000	3			10000	8		
			5132	1000	25	24000	4,38	1000	49	52000	4,72
				10000	1			10000	8		

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	N°sample	Reference method : ISO 21528-2♦				Alternative method: 3M™ Petrifilm *Enterobacteriaceae* 24h ± 2h at 37°C ± 1°C			
				Dilution	cfu/plate	cfu/g	log cfu/g	Dilution	cfu/Petrifilm test	cfu/g	log cfu/g
Pâté for cat Batch 1 Aerobic mesophilic flora: <10CFU/g	*Citrobacter braakii* Ad833	1	4758	10	25	230	2,36	10	34	320	2,51
				100	0			100	1		
			4759	10	28	270	2,43	10	40	390	2,59
				100	2			100	3		
			4760	10	22	220	2,34	10	30	290	2,46
				100	2			100	2		
			4761	10	27	270	2,43	10	31	300	2,48
				100	3			100	2		
			4762	10	25	250	2,40	10	33	320	2,51
				100	2			100	2		
		2	4763	100	49	4700	3,67	100	60	5700	3,76
				1000	3			1000	3		
			4764	100	52	5300	3,72	100	57	5800	3,76
				1000	6			1000	7		
			4765	100	58	5900	3,77	100	38	4200	3,62
				1000	7			1000	8		
			4766	100	35	3500	3,54	100	49	5200	3,72
				1000	4			1000	8		
			4767	100	41	4500	3,65	100	56	6000	3,78
				1000	9			1000	10		
		3	4768	1000	74	75000	4,88	1000	112	110000	5,04
				10000	8			10000	9		
			4769	1000	97	95000	4,98	1000	99	100000	5,00
				10000	8			10000	16		
			4770	1000	91	93000	4,97	1000	90	91000	4,96
				10000	11			10000	10		
			4771	1000	84	81000	4,91	1000	94	95000	4,98
				10000	5			10000	10		
			4772	1000	101	100000	5,00	1000	85	85000	4,93
				10000	11			10000	8		
Pâté for cat Batch 2 Aerobic mesophilic flora: <10CFU/g		1	4773	10	31	320	2,51	10	24	230	2,36
				100	4			100	1		
			4774	10	19	180	2,26	10	33	320	2,51
				100	1			100	3		
			4775	10	31	310	2,49	10	30	290	2,46
				100	3			100	2		
			4776	10	44	420	2,62	10	34	320	2,51
				100	2			100	1		
			4777	10	36	360	2,56	10	24	260	2,41
				100	4			100	4		
		2	4778	100	41	4000	3,60	100	40	4100	3,61
				1000	3			1000	5		
			4779	100	40	4300	3,63	100	52	5000	3,70
				1000	7			1000	3		
			4780	100	39	3900	3,59	100	44	4100	3,61
				1000	4			1000	1		
			4781	100	46	5000	3,70	100	44	4200	3,62
				1000	9			1000	2		
			4782	100	47	4800	3,68	100	47	4800	3,68
				1000	6			1000	6		
		3	4783	1000	84	88000	4,94	1000	79	79000	4,90
				10000	13			10000	8		
			4784	1000	74	73000	4,86	1000	88	83000	4,92
				10000	6			10000	3		
			4785	1000	110	110000	5,04	1000	111	110000	5,04
				10000	11			10000	10		
			4786	1000	85	83000	4,92	1000	74	73000	4,86
				10000	6			10000	6		
			4787	1000	98	97000	4,99	1000	82	81000	4,91
				10000	9			10000	7		

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	N°sample	Reference method : ISO 21528-2♦				Alternative method: 3M™ Petrifilm *Enterobacteriaceae* 24h ± 2h at 37°C ± 1°C			
				Dilution	cfu/plate	cfu/g	log cfu/g	Dilution	cfu/Petrifilm test	cfu/g	log cfu/g
Process water (zucchini and split peas) Batch 1 Aerobic mesophilic flora: 0 CFU/g	*Escherichia coli 93*	1	5183	10	38	360	2,56	10	23	230	2,36
				100	2			100	2		
			5184	10	29	290	2,46	10	18	180	2,26
				100	3			100	2		
			5185	10	33	340	2,53	10	22	260	2,41
				100	4			100	6		
			5186	10	35	340	2,53	10	27	280	2,45
				100	2			100	4		
			5187	10	24	240	2,38	10	32	340	2,53
				100	2			100	5		
		2	5188	100	51	5400	3,73	100	51	5100	3,71
				1000	8			1000	5		
			5189	100	42	4000	3,60	100	42	4100	3,61
				1000	2			1000	3		
			5190	100	83	8000	3,90	100	44	4500	3,65
				1000	5			1000	6		
			5191	100	41	3800	3,58	100	40	4000	3,60
				1000	1			1000	4		
			5192	100	44	4300	3,63	100	59	5800	3,76
				1000	3			1000	5		
		3	5198	1000	88	84000	4,92	1000	81	75000	4,88
				10000	4			10000	2		
			5199	1000	88	89000	4,95	1000	84	82000	4,91
				10000	10			10000	6		
			5200	1000	81	84000	4,92	1000	90	95000	4,98
				10000	11			10000	15		
			5201	1000	92	90000	4,95	1000	87	91000	4,96
				10000	7			10000	13		
			5202	1000	81	81000	4,91	1000	89	89000	4,95
				10000	8			10000	9		
Process water (pilchards) Batch 2 Aerobic mesophilic flora: 0 CFU/g		1	5208	10	16	190	2,28	10	37	370	2,57
				100	5			100	4		
			5209	10	24	230	2,36	10	25	270	2,43
				100	1			100	5		
			5210	10	18	180	2,26	10	35	350	2,54
				100	2			100	3		
			5211	10	28	260	2,41	10	22	270	2,43
				100	0			100	8		
			5212	10	33	330	2,52	10	23	260	2,41
				100	3			100	5		
		2	5213	100	34	3500	3,54	100	51	5000	3,70
				1000	5			1000	4		
			5214	100	41	3700	3,57	100	52	5700	3,76
				1000	0			1000	11		
			5215	100	45	4300	3,63	100	59	5600	3,75
				1000	2			1000	3		
			5216	100	42	4000	3,60	100	50	4800	3,68
				1000	2			1000	3		
			5217	100	41	4000	3,60	100	44	4500	3,65
				1000	3			1000	5		
		3	5223	1000	64	68000	4,83	1000	77	75000	4,88
				10000	11			10000	5		
			5224	1000	71	74000	4,87	1000	82	79000	4,90
				10000	10			10000	5		
			5225	1000	66	67000	4,83	1000	63	63000	4,80
				10000	8			10000	6		
			5226	1000	90	87000	4,94	1000	77	74000	4,87
				10000	6			10000	4		
			5227	1000	79	76000	4,88	1000	89	92000	4,96
				10000	5			10000	12		

♦ Analyses performed according to the COFRAC accreditation

Appendix 7 - Accuracy profile study: summarized results

(Food) Category 1	Meat products
(Food) Type 1	Pork, beef, veal raw and cooked (pork pâté)

			Reference method result					Alternative method result				
Sample Name	(Food) item	Level	rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
6862-6866	Pork pâté	1	140	160	140	170	260	240	230	280	320	240
6867-6871	Pork pâté	1	190	340	200	290	240	250	250	300	290	160
4818-4822	Pork pâté	2	14000	11000	14000	14000	12000	12000	12000	18000	15000	11000
4843-4847	Pork pâté	2	18000	15000	15000	17000	16000	16000	18000	11000	12000	17000
4828-4832	Pork pâté	3	26000	25000	18000	24000	23000	25000	27000	20000	31000	22000
4853-4857	Pork pâté	3	29000	24000	25000	25000	23000	33000	29000	26000	32000	28000

(Food) Category 2	Dairy products
(Food) Type 2	Milk and cream (pasteurized milk)

			Reference method result					Alternative method result				
Sample Name	(Food) item	Level	rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
5403-5407	Pasteurized milk	1	240	220	340	310	280	260	220	270	310	320
5418-5422	Pasteurized milk	1	310	280	240	170	250	270	360	210	250	210
5408-5412	Pasteurized milk	2	5200	4700	3700	4700	3400	4500	4900	4400	4500	3600
5423-5427	Pasteurized milk	2	5100	4200	3900	4000	5000	4300	6300	4900	3900	5200
5413-5417	Pasteurized milk	3	100000	85000	83000	87000	77000	93000	86000	91000	83000	95000
5428-5432	Pasteurized milk	3	82000	85000	87000	97000	84000	85000	98000	92000	88000	87000

(Food) Category 3	Seafood
(Food) Type 3	Raw seafood (salmon fillet)

			Reference method result					Alternative method result				
Sample Name	(Food) item	Level	rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
5626-5630	Frozen salmon fillet	1	390	430	360	400	300	240	360	310	290	210
5824-5828	Frozen salmon fillet	1	520	360	520	430	520	460	380	490	410	580
5631-5635	Frozen salmon fillet	2	4000	5600	6300	4500	4800	3500	4500	5200	4700	4800
5829-5833	Frozen salmon fillet	2	3700	4800	4900	5000	5100	5500	4800	4700	5300	4800
5636-5640	Frozen salmon fillet	3	83000	110000	110000	91000	110000	100000	97000	120000	110000	93000
5834-5838	Frozen salmon fillet	3	98000	100000	110000	93000	92000	92000	100000	110000	110000	90000

(Food) Category 4	Vegetables
(Food) Type 4	Fresh and frozen products (Green beans)

			Reference method result					Alternative method result				
Sample Name	(Food) item	Level	rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
4544-4548	Green beans	1	250	250	230	250	240	330	240	310	270	280
4559-4563	Green beans	1	240	150	310	200	240	270	210	230	320	200
4549-4553	Green beans	2	2600	3600	3800	3300	4300	4200	5200	4300	4500	4600
4564-4568	Green beans	2	3300	2500	2900	3300	2900	4400	4400	4300	3200	4000
4554-4558	Green beans	3	60000	71000	79000	69000	51000	74000	85000	83000	72000	84000
4569-4573	Green beans	3	51000	62000	55000	63000	64000	77000	82000	85000	95000	95000

(Food) Category 5	Miscellaneous and egg products
(Food) Type 5	Egg based products (whole liquid egg)

			Reference method result					Alternative method result				
Sample Name	(Food) item	Level	rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
6428-6432	Whole liquid egg	1	140	150	110	91	140	230	180	140	220	160
6857-6861	Whole liquid egg	1	220	230	280	190	210	200	160	150	240	290
5093-5097	Whole liquid egg	2	2700	2800	3400	2900	3000	2700	3400	3600	1500	3900
5118-5122	Whole liquid egg	2	1800	1500	1600	2700	1900	4500	3300	3900	3200	3100
5103-5107	Whole liquid egg	3	28000	48000	39000	55000	66000	44000	60000	32000	58000	75000
5128-5132	Whole liquid egg	3	29000	29000	34000	39000	24000	67000	62000	37000	54000	52000

(Food) Category 6	Feed
(Food) Type 6	Cooked or dehydrated products (Pâté for cat)

			Reference method result					Alternative method result				
Sample Name	(Food) item	Level	rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
4758-4762	Pâté for cat	1	230	270	220	270	250	320	390	290	300	320
4773-4777	Pâté for cat	1	320	180	310	420	360	230	320	290	320	260
4763-4767	Pâté for cat	2	4700	5300	5900	3500	4500	5700	5800	4200	5200	6000
4778-4782	Pâté for cat	2	4000	4300	3900	5000	4800	4100	5000	4100	4200	4800
4768-4772	Pâté for cat	3	75000	95000	93000	81000	100000	110000	100000	91000	95000	85000
4783-4787	Pâté for cat	3	88000	73000	110000	83000	97000	79000	83000	110000	73000	81000

(Food) Category 7	Environmental samples
(Food) Type 7	Process water (Batch 1: Zucchini and split peas; Batch 2: Pilchards)

			Reference method result					Alternative method result				
Sample Name	(Food) item	Level	rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
5183-5187	Rinsed water	1	360	290	340	340	240	230	180	260	280	340
5208-5212	Rinsed water	1	190	230	180	260	330	370	270	350	270	260
5188-5192	Rinsed water	2	5400	4000	8000	3800	4300	5100	4100	4500	4000	5800
5213-5217	Rinsed water	2	3500	3700	4300	4000	4000	5000	5700	5600	4800	4500
5198-5202	Rinsed water	3	84000	89000	84000	90000	81000	75000	82000	95000	91000	89000
5223-5227	Rinsed water	3	68000	74000	67000	87000	76000	75000	79000	63000	74000	92000

Appendix 8 – Inclusivity / Exclusivity: raw data (initial validation and extension study)

INCLUSIVITY (Initial validation)							
Strain			Origin	Positive strains			
				VRBG		Petrifilm	
				Growth	Characteristic colonies	Growth	Characteristic colonies
1	*Shigella flexneri*	CIP8248	/	+	+	+	+ G-
2	*Shigella sonnei*	CIP8249	/	+	+	+	+ G-
3	*Salmonella enteritidis*	CIP8297	/	+	+	+	+ G+
4	*Salmonella typhimurium*	CIP5858	/	+	+	+	+ G+
5	*Erwinia carotovora*	CIP8283	/	-	-	+	+ G-
6	*Erwinia carotovora*	CIP103762	/	-	-	-	-
7	*Escherichia coli*	CIP54117	/	+	+	+	+ G+
8	*Escherichia coli*	CIP54127	/	+	+	+	+ G+
9	*Citrobacter diversus*	CIP8294	/	+	+	+	+ G+
10	*Citrobacter freundii*	CIP5732	/	+	+	+	+ G+
11	*Klebsiella pneumoniae*	CIP8291	/	+	+	+	+ G+
12	*Klebsiella oxytoca*	CIP7932	/	+	+	+	+ G+
13	*Enterobacter cloacae*	Adria 10	Raw milk	+	+	+	+ G+
14	*Enterobacter aerogenes*	CIP 6086	/	+	+	+	+ G+
15	*Serratia liquefaciens*	Adria 8	Egg product	+	+	+	+ G-
16	*Hafnia alvei*	Adria 138	Spices	+	+	+	+ G+
17	*Edwarsiella tarda*	CIP7861	/	+	+	+	+ G-
18	*Proteus mirabilis*	Adria 54	Poultry meat	+	+	+	+ G+
19	*Proteus vulgaris*	Adria 56	Food product	+	+	+	+ G+
20	*Providencia rettgeri*	Adria 112	Egg white	+	+	+	+ G+
21	*Morganella morganii*	CIPA236	/	+	+	+	+ G+
22	*Yersinia enterocolitica*	CIP8027	/	+	+	+	+ G-
23	*Kluyvera ascorbata*	CIP8295	/	+	+	+	+ G+

EXCLUSIVITY (Initial validation)							
Strain			Origin	Negative strains			
				VRBG		Test Petrifilm	
				Growth	Characteristic colonies	Growth	Characteristic colonies
1	*Aeromonas hydrophila*	CIP5750	/	+	+	+	+ G+
2	*Aeromonas bestiarum*	CIP7430	Fish	+	+	+	+ G-
3	*Aeromonas sobria*	CIP7433	Fish	-	-	-	-
4	*Xanthomonas maltophilia*	CIP6077	/	+	+	+	+ G+
5	*Pseudomonas fluorescens*	CIP5690	/	-	-	-	-
6	*Pseudomonas putida*	Adria 4	Poultry meat	-	-	-	-
7	*Pseudomonas putida*	Adria 8	Egg product	-	-	-	-
8	*Pseudomonas aeruginosa*	CIP22	Clinic	-	-	+ (*)	-
9	*Acinetobacter spp*	Adria 46-2	Poultry meat	-	-	-	-
10	*Bacillus circulans*	ATCC4513	/	-	-	-	-
11	*Lactobacillus plantarum*	CIP159	/	-	-	-	-
12	*Enterococcus faecalis*	ATCC29212	/	-	-	-	-
13	*Staphylococcus aureus*	CIP658	/	-	-	-	-

(*) Red colonies without acidification zone and gas G- : Red colonies surrounded with a yellow zone
G+: Red colonies with red bubbles

INCLUSIVITY (Extension study, 2017)								
Strain			Reference	Origin	PCA ufc/plate	VRBG ufc/plate	PEB	
							cfu/ Petrifilm	Gas (+/-)
1	*Buttiauxella*	agrestis	Ad1328	Whole egg	22	107	13	+
2	*Citrobacter*	youngae	Ad1372	Water	95	95	81	+
3	*Citrobacter*	braakii	Ad833	Beef trim	67	23	41	+
4	*Citrobacter*	farmeri	Ad1116	Egg environment	75	31	64	+
5	*Cronobacter*	malonaticus	DSM18702	Milk powder	27	149	134	+
6	*Cronobacter*	sakazakii	Ad2412	Milk powder	38	65	47	+
7	*Enterobacter*	hormaechei	Ad990	Butter	102	96	84	+
8	*Enterobacter*	aerogenes	Ad2569	Cheese	49	56	30	+
9	*Escherichia*	hermannii	Ad464	Raw milk	33	19	31	+
10	*Escherichia*	fergusonii	Ad1381	Tap water	42	23	38	+
11	*Escherichia*	vulneris	134	Pork liver	32	25	20	-
12	*Escherichia*	coli	Ad1915	Poultry meat	66	52	61	+
13	*Hafnia*	alvei	A00C069	Poultry meat	72	57	52	+
14	*Kluyvera*	intermedia	60	Vegetables	33	27	33	+
15	*Leclercia*	adecarboxylata	Ad707	Milk powder	24	20	20	+
16	*Lelliottia*	amnigena	126	Ground beef	120	111	81	+
17	*Pantoea*	agglomerans	A00L065	Cheese	117	67	63	+
18	*Pluralibacter*	gergoviae	CIP76.1		94	102	68	+
19	*Providencia*	stuartii	Ad1575	River water	56	114	57	-
20	*Raoultella*	terrigena	Ad1368	Tap water	59	70	39	+
21	*Siccibacter*	turicensis	Ad1445	Milk powder	20	16	24	+
22	*Salmonella enterica*	Anatum	Ad2727	Seafood	69	74	58	+
23	*Serratia*	fonticola	Ad1696	Salmon	30 (-6)	19(-7)	102(-6)	-
24	*Serratia*	marcescens	Ad2604	Dairy product	78	39	46	-
25	*Serratia*	liquefaciens	Ad2601	Dairy product	76	33	48	-
26	*Shimwellia*	blattae	ATCC29907		18	10	15	+
27	*Yersinia*	enterocolitica	Ad1028	Speck	62	44	60	-

EXCLUSIVITY (Extension study, 2017)							
Strain			Reference	Origin	PCA cfu/plate	VRBG cfu/plate	PEB cfu/Petrifilm
1	*Acetobacter*	orientalis	DSM15550T	Flower	154	0	0
2	*Acinetobacter*	baumanii	Ad1090	Feeding stuff	280	160 (µcolonies NC)	µcolonies TNTC
3	*Carnobacterium*	viridans	ATCCBAA36	/	14	0	0
4	*Agrobacterium*	tumefasciens	Ad1550	Stagnant water	257	0	0
5	*Alcaligenes*	faecalis	ATCC8750	/	190	2 brown (NC)	0
6	*Arcobacter*	butzleri	Ad1881	Poultry environment	98	0	0
7	*Asaia*	siamensis	CIP107278T	Flower	112	0	0
8	*Burkholderia*	sp	Ad2003	Slaughterhouse	42	0	0
9	*Flavobacterium*	hydratis	Ad1323	Whole egg	188	0	0
10	*Gluconobacter*	oxydans	Ad997	Sweetened drink	257	0	0
11	*Comomonas*	aquatica	Ad1543	Water	213	µcolonies (NC)	0
12	*Moraxella*	sp	IB3	Egg white	127	0	0
13	*Pandoraea*	sp	Ad1882	Slaughterhouse	300	µcolonies TNTC	0
14	*Plesiomonas (Aeromonas)*	shigelloïdes	Ad673	Fish	15	49	68
15	*Psychrobacter*	alimentarius	Ad2570	Cheese	211	0	0
16	*Ralstonia*	mannitolilytica	Ad1059	Poultry meat	38	0	0
17	*Sphingobacterium*	sp	Ad1324	Whole egg	95	0	0

TNTC: Too Numerous To Count NC: Non characteristic colonies