

NF VALIDATION
Validation of alternative analytical methods
Application in food microbiology

Summary report

Validation study according to the EN ISO 16140-2:2016

TEMPO® EB

(Certificate number: BIO 12/21 - 12/06)
for the enumeration of *Enterobacteriaceae*
in a broad range of food and pet foods

Quantitative method

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This report consists of 53 pages, including 9 appendices.

Only copies including the totality of this report are authorised.

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 **bioMérieux**.

Measurement uncertainty on the reference method results is not taken into account to provide the conclusion in this report; this measurement uncertainty is however available.

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

Validation protocols	<ul style="list-style-type: none"> ▪ ISO 16140-1 (2016): Microbiology of the food chain - Method validation — <i>Part 1: Vocabulary</i> ▪ ISO 16140-2 (2016): Microbiology of the food chain - Method validation — <i>Part 2: Protocol for the validation of alternative (proprietary) methods against a reference method</i> ▪ AFNOR technical rules (PR Revision 7).
Reference method[♦]	- ISO 21528-2:2017 - Microbiology of the food chain - Horizontal method for detection and enumeration of <i>Enterobacteriaceae</i> - Part 2: Colony-count technique
Alternative method	TEMPO[®] EB
Scope	<input checked="" type="checkbox"/> Broad range of food <input checked="" type="checkbox"/> Pet food
Certification organization	AFNOR Certification (http://nf-validation.afnor.org/)

[♦] Analyses performed according to the COFRAC accreditation

1 INTRODUCTION

The TEMPO® EB method was validated in December 2006 (certificate number BIO 12/21 – 12/06), for a broad range of food and pet foods. Renewal studies were performed in 2010, 2014. The renewal was performed in December 2018 and in October 2022 according to the ISO 16140-2 (2016).

2 METHODS DESCRIPTION

2.1 Alternative method

2.1.1 Principle

TEMPO® system is an **automated method** associating an **innovative card** with an adapted medium to ensure rapid enumeration of several quality indicators.

The TEMPO® EB test consists of a vial of culture medium and a card, which are specific to this test. The culture medium is inoculated with the sample to be tested and homogeneously transferred by the TEMPO® Filler into the card containing 48 wells of three different volumes. The TEMPO® Filler seals the card in order to avoid any risk of contamination during subsequent handling.

The culture medium contains fluorescent pH indicator which, when its pH is neutral, emits a signal detected by the TEMPO® Reader. During incubation, the *Enterobacteriaceae* present in the card assimilate the nutrients in the culture medium, resulting in a decrease of pH and the extinction of the fluorescent signal.

Depending on the number and size of the positive wells, the TEMPO® system deduces the number of *Enterobacteriaceae* present in the original sample according to a calculation based on the MPN (Most Probable Number) method. Card reading, interpretation and reporting are managed by the TEMPO® system after 22 h incubation at 35°C. TEMPO® EB method allows *Enterobacteriaceae* enumeration.

2.1.2 Protocol

The flow diagram of the alternative method is provided in **Appendix 1**.

2.1.3 Restrictions

There is no restriction for use.

2.2 Reference method♦

The standard method used for the initial validation and 2010 and 2014 renewal studies was the ISO 21528-2 (2004): Microbiology of food and animal feeding stuffs - Horizontal methods for the detection and enumeration of *Enterobacteriaceae* - Part 2: Colony-count method.

For the renewal study performed in 2018 and this one, the reference method is the ISO 21528-2 (2017): Microbiology of the food chain - Horizontal method for detection and enumeration of *Enterobacteriaceae* - Part 2: Colony-count technique.

The modifications between the two versions are considered as minor and have no impact on the previous data

The protocol of the method is given in **Appendix 2**.

2.3 Protocols applied during the initial validation and the renewal study

The shortest incubation time was tested: 22 h at 35°C ± 1°C.

3 INITIAL VALIDATION, EXTENSION/RENEWAL STUDIES: RESULTS

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.

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/>.

3.1.1 Relative trueness

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 samples.

3.1.1.1 Number and nature of the samples

Five food categories and the pet food category were tested with a minimum of 15 interpretable results per category and 5 interpretable results per type.

88 samples were tested for the initial validation study in 2006 and 52 for the renewal study in 2018. The repartition per tested category and type is provided in Table 1.

Table 1 – Repartition per tested category and type

Category	Type	Number of samples tested			Number of samples with interpretable results by both methods				
		2006	2018	Total	2006	2018	Total		
1	Meat and meat products	a	Raw meat	12	0	12	10	0	10
		b	Delicatessen	7	0	7	7	0	7
		c	RTE meat products	3	4	7	2	3	5
		Total		22	4	26	19	3	22
2	Dairy products	a	Raw milk	4	1	5	4	1	5
		b	Cheese	9	0	9	5	0	5
		c	Milk powder	2	5	7	1	5	6
		Total		15	6	21	10	6	16
3	Vegetables	a	RTC	7	6	13	3	3	6
		b	Unseasoned RTE	3	4	7	1	4	5
		c	RTE/RTH	4	6	10	2	3	5
		Total		14	16	30	6	10	16
4	Fish and seafood	a	Frozen	3	4	7	1	4	5
		b	Smoked	2	6	8	1	4	5
		c	RTE, RTRH	3	4	7	3	2	5
		Total		8	14	22	5	10	15
5	Egg products	a	Liquid egg	8	1	9	4	1	5
		b	RTE egg products	6	2	8	4	1	5
		c	Pastries	4	3	7	3	2	5
		Total		18	6	24	11	4	15
6	Pet food	a	Low moisture products	3	3	6	2	3	5
		b	High moisture products	6	0	6	6	0	6
		c	Raw meat	2	3	5	2	3	5
		Total		11	6	17	10	6	16
All categories		88	52	140	61	39	100		

Combining all the categories, 140 samples were analysed, leading to 100 exploitable results.

3.1.1.2 Artificial and natural contamination of the samples

15 samples were artificially contaminated using seeding or spiking protocol; 14 gave interpretable results. The inoculated strains and the injury protocols applied are provided in **Appendix 3**.

100 samples gave interpretable results by both methods. 86 samples giving interpretable results by both methods were naturally contaminated.

86 % of the samples were naturally contaminated.

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 category, and 5 interpretable results per tested type.

The data are classified in four 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 were 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 log₁₀ 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 more. These results are not included in the calculations but also appear on the graphs.
- Samples with no result (ND) (plates impossible to enumerate due to high background microflora).

Table 2 - Classification of the data

Category		Type	Number of samples tested	Number of interpretable results by both methods	Number of samples with no result (ND)	Number of samples with <4 CFU/plate	Number of samples with <1 CFU or >300 CFU/plate	
1	Meat and meat products	a	Raw meat	12	10	2	0	0
		b	Delicatessen	7	7	0	0	0
		c	RTE meat products	7	5	1	0	1
		Total		26	22	3	0	1
2	Dairy products	a	Raw milk	5	5	0	0	0
		b	Cheese	9	5	3	0	1
		c	Milk powder	7	6	0	1	0
		Total		21	16	3	1	1
3	Vegetables	a	RTC	13	6	0	1	6
		b	Unseasoned RTE	7	5	1	1	0
		c	RTE/RTH	10	5	1	0	4
		Total		30	16	2	2	10
4	Fish and seafood	a	Frozen	7	5	0	0	2
		b	Smoked	8	5	0	1	2
		c	RTE, RTRH	7	5	0	0	2
		Total		22	15	0	1	6
5	Egg products	a	Liquid egg	9	5	1	0	3
		b	RTE egg products	8	5	0	0	3
		c	Pastries	7	5	0	1	1
		Total		24	15	1	1	7
6	Pet food	a	Low moisture products	6	5	0	0	1
		b	High moisture products	6	6	0	0	0
		c	Raw meat	5	5	0	0	0
		Total		17	16	0	0	1
All categories			140	100	9	5	26	

The samples, which were not used in the calculations, are provided in Table 3.
Note that the 9 (ND) samples were obtained with the reference method.

Table 3 - Samples which were not used in the calculations

Sample N°	Product	Reference method: ISO 21528-2*	Alternative method: TEMPO EB	Category	Type
565	Raw meat	ND	>5,69	1	a
566	Raw meat	ND	>5,69	1	a
595	RTRH meat product (pork)	ND	>5,69	1	c
6694	RTRH meat product (shepherd's pie)	<1,00	<1,00	1	c
727	Cheese	ND	5,57	2	b
825	Cheese	6,11	>5,69	2	b
847	Cheese	ND	>5,69	2	b
1001	Milk powder	2,70 *	3,15	2	c
848	Cheese	ND	>5,69	2	b
627	Brussels sprouts	1,30*	1,65	3	a
631	Fried vegetables	<1,00	<2,00	3	a
1014	Diced tomatoes	<2,00	1,51	3	a
1085	Mix vegetables	<2,00	<1,00	3	a
6864	Frozen sliced leeks	<1,00	<1,00	3	a
6865	Frozen carrots	<1,00	<1,00	3	a
7083	Frozen spring vegetables	<1,00	<1,00	3	a
844	Sliced carrots	1,40 *	1,65	3	b
877	Unseasoned sliced carrots	ND	>5,69	3	b
561	Spinach with bechamel	ND	>5,69	3	c
1084	RTE salad	<2,00	<1,00	3	c
6871	RTE salad (macedoine)	<1,00	<1,00	3	c
7078	Marinated artichoke heart	<1,00	<1,00	3	c
7224	RTE salad (cucumber)	<1,00	<1,00	3	c
946	Fish	<1,00	<1,00	4	a
1083	Tuna	>6,18	>5,69	4	a
846	Smoked salmon	1,40 *	1,43	4	b
6867	Smoked fish fillets	<1,00	<1,00	4	b
6869	Smoked salmon	<1,00	<1,00	4	b
6690	Cooked mussels meat	1,85	<1,00	4	c
6695	RTE salad (smoked salmon)	<1,00	<1,00	4	c
728	Liquid egg	ND	>5,69	5	a
890	White liquid egg	1,60	<1,00	5	a
948	Liquid egg	>7,18	>5,69	5	a
950	Yellow liquid egg	>7,18	>5,69	5	a
949	Tortilla	>7,18	>5,69	5	b
1012	Scrambled eggs	5,33	>5,69	5	b
6870	Tortilla	<1,00	<1,00	5	b
889	Almond cream	1,54*	1,52	5	c
6700	Pastry	6,48	>6,69	5	c
888	Bird seeds	<1,00	<1,00	6	a

ND: samples with non-determined result (high background microflora)

*: samples with less than 4 colonies on the plate

♦ Analyses performed according to the COFRAC accreditation

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 6 show the data plotted for each individual category.

The Figure 7 shows the data plotted for all the products.

Figure 1 - Data plotted for the Meat and meat products

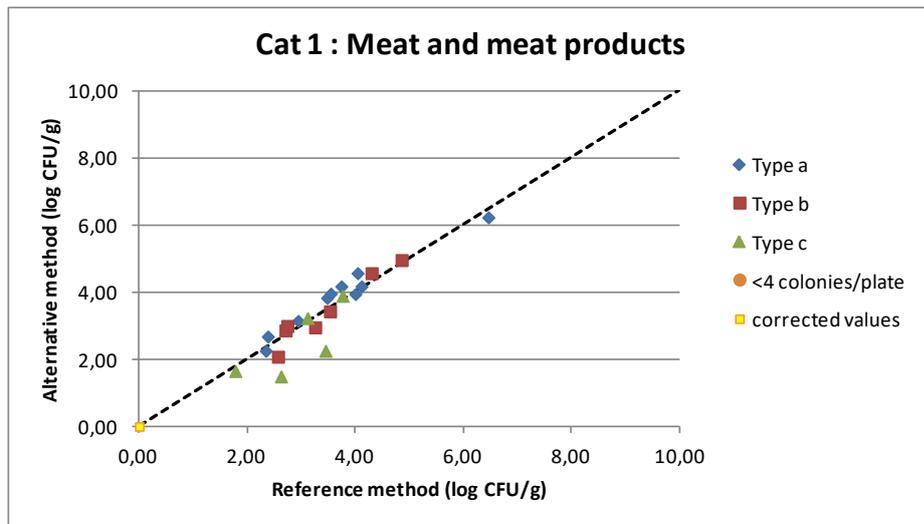


Figure 2 - Data plotted for Dairy products

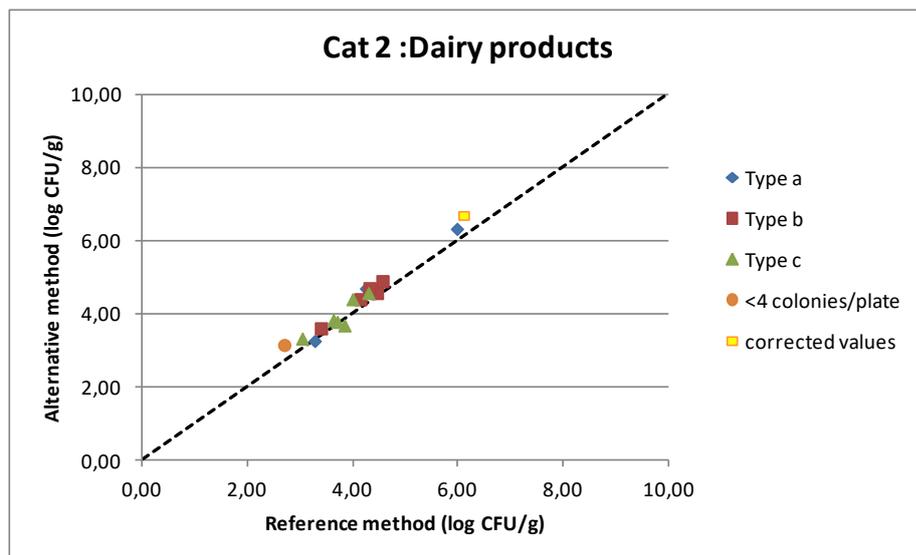


Figure 3 - Data plotted for **Vegetables**

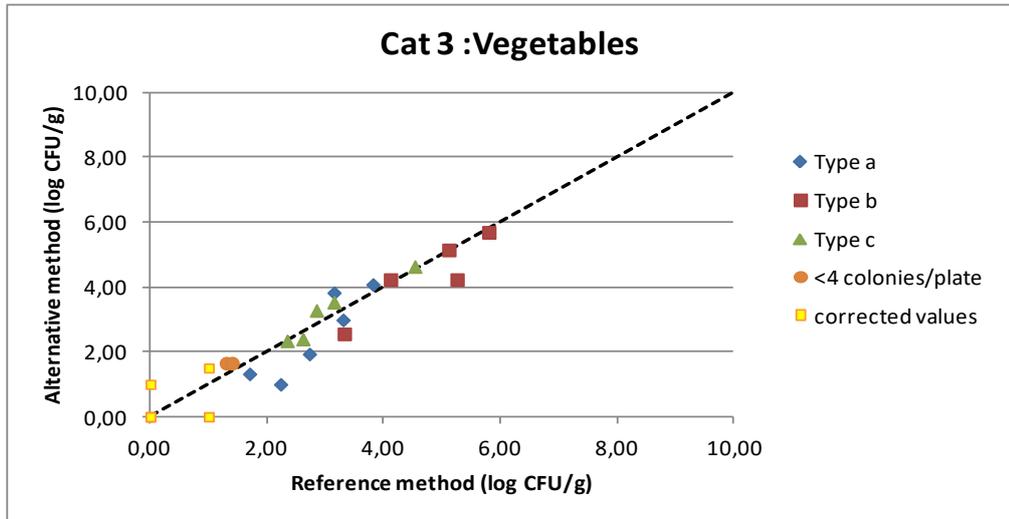


Figure 4 - Data plotted for **Fish and seafood**

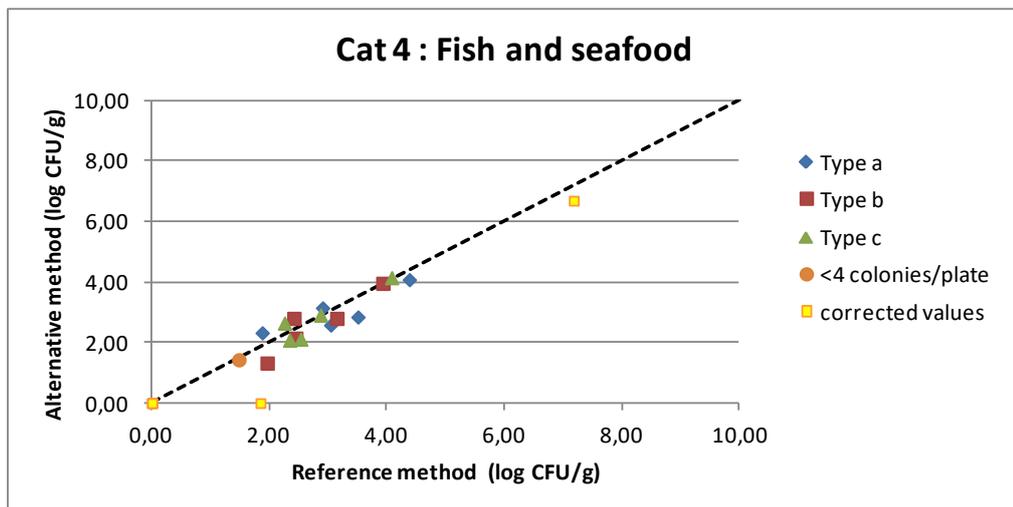


Figure 5 - Data plotted for **Egg products**

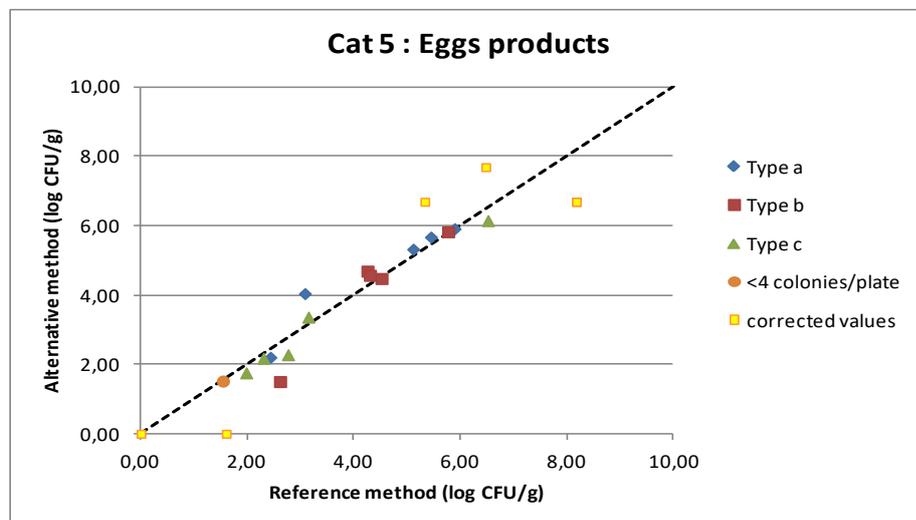


Figure 6 - Data plotted for **Pet food**

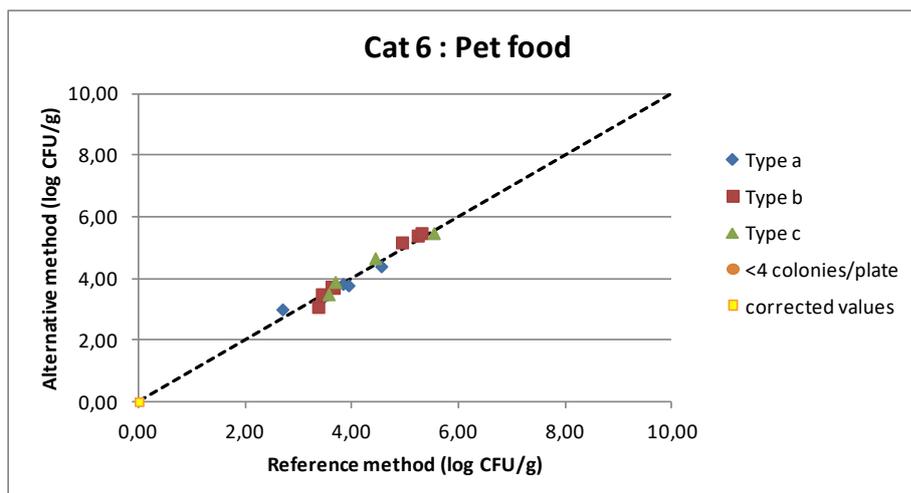
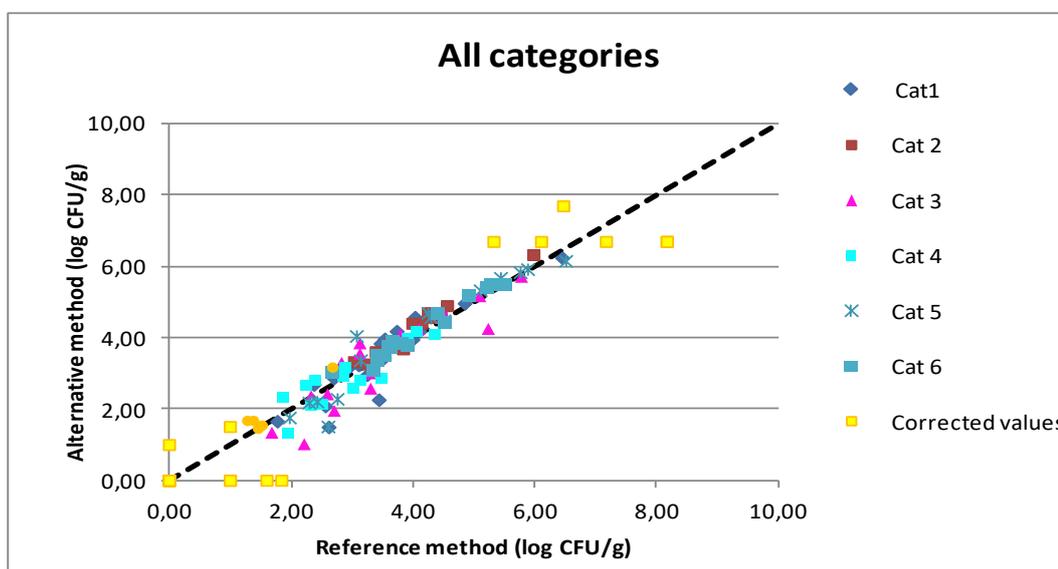


Figure 7 - Data plotted for **all categories**



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

Table 4 - Calculated values

Category		Number of samples with interpretable results	\bar{D} (bias)	SD	Lower limit (95%)	Upper limit (95%)
1	Meat and meat products	22	-0,02	0,45	0,97	0,94
2	Dairy products	16	0,21	0,17	-0,14	0,56
3	Vegetables	16	-0,18	0,54	-1,38	1,02
4	Fish and seafood	15	-0,12	0,36	-0,95	0,71
5	Egg products	15	-0,01	0,47	-1,05	1,02
6	Pet food	16	0,05	0,17	-0,32	0,42
All categories		100	-0,01	0,40	-0,81	0,79

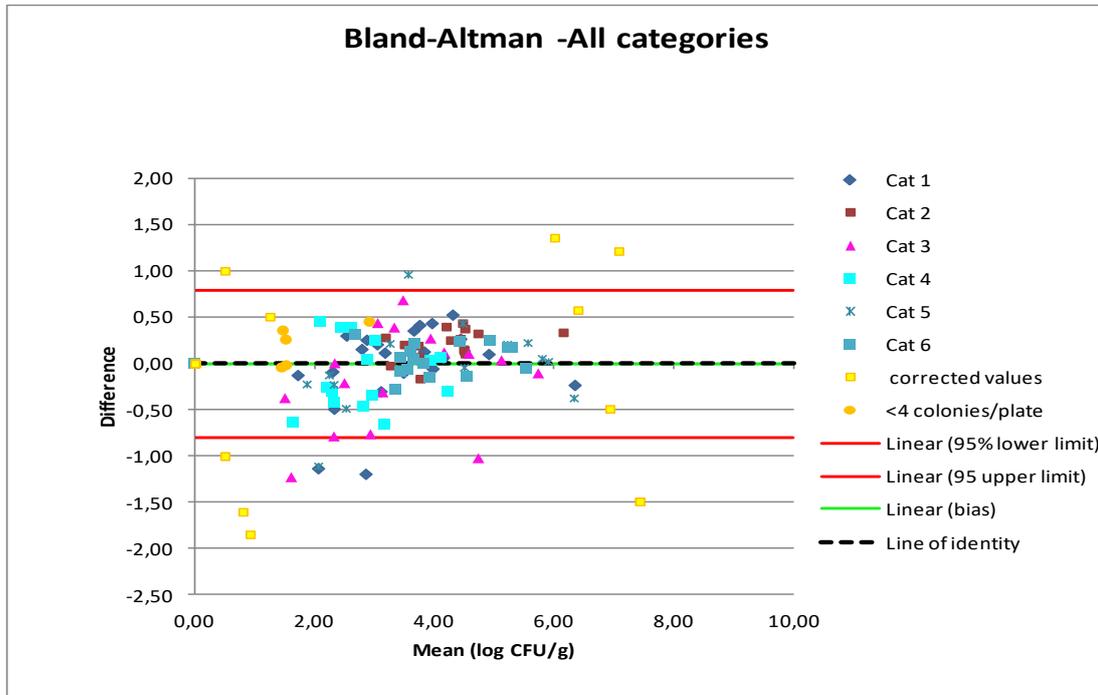
\bar{D} : Average difference

SD: Standard deviation of differences

The average differences vary from -0.18 log (vegetables) to 0.21 log (dairy products). This bias for all the combined categories is closed to 0 (-0.01 log).

The Bland-Altman difference plot for all the samples is given Figure 8.

Figure 8 – Bland-Altman difference plot for all the samples



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.

Table 5 - Analysis of the data out of the confidence limits

Values in **green**: differences in favour of the alternative method
 Values in **red**: differences in favour of the reference method
 Values in **black**: equivalent results by both methods

LCL: Lower confidence limit

UCL: Upper confidence limit

Corrected value

Classification of the data	Category	Type	Sample N°	Product	Reference method	Alternative method	Values before correction (reference and/or alternative)	Mean	Difference	LCL and UCL (CLs)
Interpretable results by both methods	1	c	6684	RTRH meat product (chicken)	3,45	2,26	/	2,85	-1,19	-0,81/ 0,79
	1	c	6686	Cooked roast chicken	2,62	1,49	/	2,06	-1,13	
	3	a	630	Zucchini	2,23	1,00	/	1,62	-1,23	
	3	b	7084	Grated carrots	5,26	4,23	/	4,74	-1,02	
	5	b	7082	Mayonnaise	2,61	1,51	/	2,06	-1,11	
	5	a	6698	Whole liquid egg product	3,08	4,04	/	3,56	0,96	
< or > the quantification limit	3	a	1085	Mix vegetable	1,00	0,00	1,00	0,50	-1,00	
	3	c	1084	RTE salad	1,00	0,00	2,00/1,00	0,50	-1,00	
	4	c	6690	Cooked mussels meat	1,85	0,00	1,00	0,92	-1,85	
	5	a	890	Liquid egg white	1,60	0,00	1,00	0,80	-1,60	
	5	a	948	Liquid egg	8,18	6,69	7,18/5,69	7,44	-1,49	
	5	a	950	Liquid egg yolk	8,18	6,69	7,18/5,69	7,44	-1,49	
	5	b	949	Tortilla	8,18	6,69	7,18/5,69	7,44	-1,49	
	3	a	631	Fried vegetables	0,00	1,00	1,00/2,00	0,50	1,00	
	5	b	1012	Scrambled eggs	5,33	6,69	5,69	6,01	1,36	
	5	c	6700	Pastry	6,48	7,69	6,69	7,08	1,21	

3.1.1.5 Discordant results

16 values are outside of the confidence limits at 95%; their repartition is given in Table 6.

Some of these samples are out of confidence limits due to the shifted range of enumeration, by the use of different dilution rates between methods. However, the results of these samples are consistent with both methods.

Table 6 - Repartition of the samples outside of the 95 % confidence limits

		Number of samples
Interpretable results by both methods	< LCL	5
	> UCL	1
	Total	6
< or > the quantification limit	< LCL	7
	> UCL	3
	Total	10
Total < LCL		12
Total >UCL		4
Total		16

The number of samples below the LCL is higher than the number of samples above the UCL for samples giving interpretable results but note that the bias between both tested methods is closed to 0 (- 0.01 log).

3.1.1.6 Conclusion

The relative trueness of the alternative method is satisfying. The alternative method is equivalent to the reference 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

Six matrices were tested. A minimum of one type per category, and therefore 2 different batches, was selected, using 6 samples per type. 2 samples are contaminated at a low level, 2 at intermediate level, 2 at a high level. For each sample, 5 replicates (5 different test portions) were tested. The tested categories, types, matrix and inoculated strains are provided in Table 7.

Table 7 - Categories, types and matrices

Category	Type	Product	Inoculated strain	Origin	Inoculation level (CFU/g)
Meat and meat products	Raw meat	Ground beef	<i>Enterobacter cloacae</i> 128	Ground beef	3.10 ² 3.10 ⁴ 1.10 ⁵
Dairy products	Raw milk	Milk	<i>Escherichia coli</i> 94	Cheese	
Vegetables	RTC	Green beans	<i>Escherichia hermanii</i> Ad457	Spinach	
Fish and seafood	RTE, RTRH	Fish terrine	<i>Citrobacter freundii</i> 24	Seafood cocktail	
Egg products	Liquid egg	Liquid egg	<i>Klebsiella pneumoniae</i> 92	Pastry	
Pet foods	High moisture products	Dog pâté	<i>Hafnia alvei</i> 124	Pork liver	

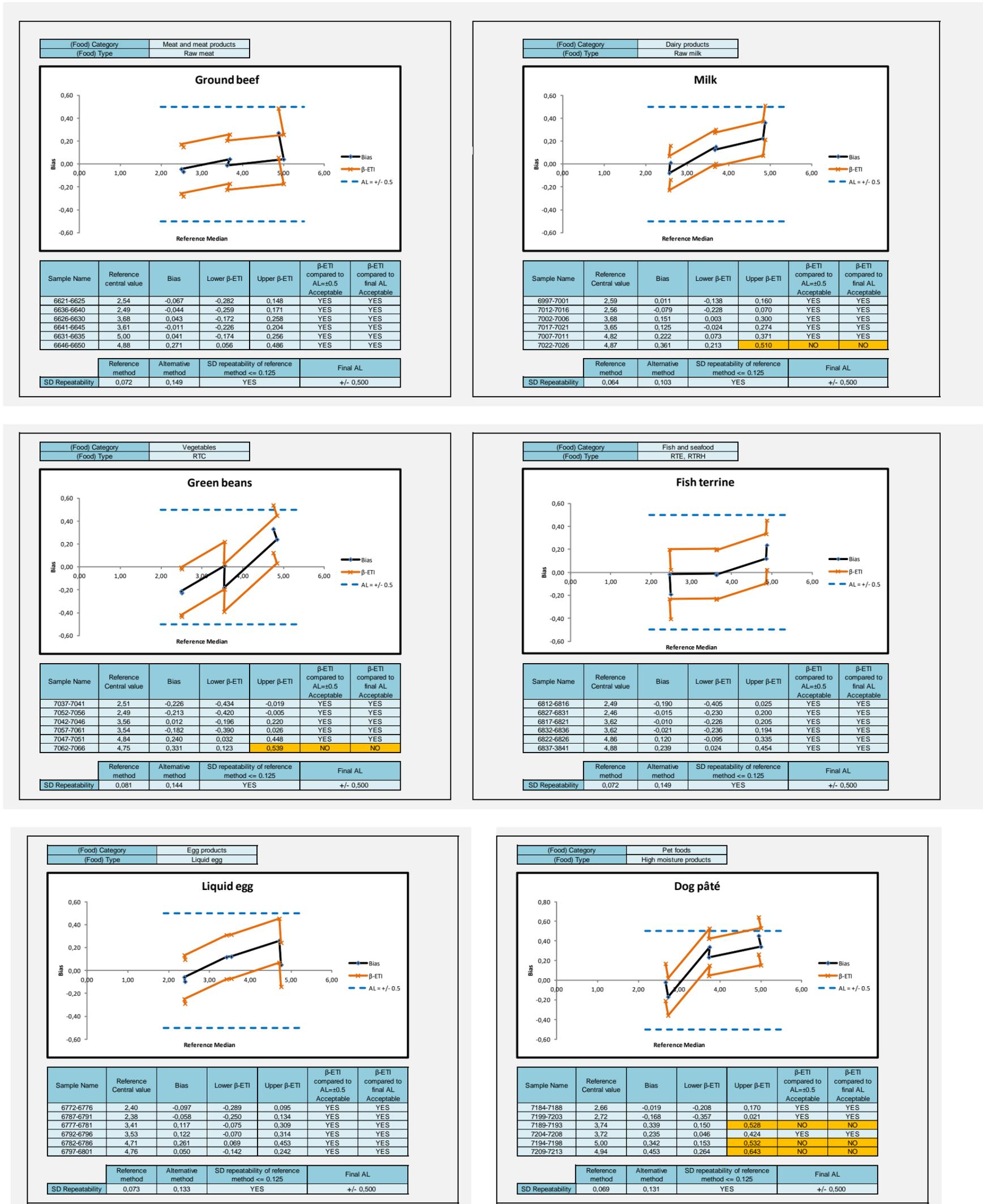
3.1.2.2 Calculation and interpretation

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 9.

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 accuracy profiles are comprised within the Acceptability Limits fixed at ± 0.5 log for ground beef, fish terrine, and liquid egg.

Figure 9 – Accuracy profiles



The accuracy profiles are outside the Acceptability Limit for:

- Milk: 1 batch for the higher inoculation level:
Upper β .ETI = 0.510,
- Green bean: 1 batch for the higher inoculation level:
Upper β .ETI = 0.539,
- Dog pâté: 1 batch for the medium inoculation level:
Upper β .ETI = 0.528
2 batches for the high inoculation level:
Upper β .ETI = 0.532 and 0.643.

3.1.2.3 Conclusion

The observed profiles are in most of the cases comprised within the Acceptability Limit fixed at ± 0.5 log.

3.1.3 Quantification limits (LOQ)

The limit of Quantification (LOQ) is the lowest analyte concentration that can be quantified with an acceptable level of precision and trueness under the conditions of the test.

The LOQ was determined as is it needed for the instrumental methods which are related to the growth of the microorganism.

3.1.3.1 Experimental design

Blank samples were tested for each category. These blank samples were used to verify the limit of quantification of the alternative method. 10 test portions from the same sample were analysed. The same food type matrices than those tested in the accuracy profile were used.

3.1.3.2 Calculation and interpretation

The threshold standard deviation S_0 was calculated as followed:

$$s_0 = \frac{1}{n-1} \sum_{j=1}^n (y_j - \bar{y})^2$$

where:

n = the total number of test portions used

y_j = the log transformed result of test portion j

y = the average log transformed result of all test portions

The limit of quantification is calculated as $LOQ = 10 s_0$.

3.1.3.3 Results

Raw data and calculation are provided in **Appendix 8**. The results are summarized in Table 8.

Table 8 - Quantification limits per tested matrix

Matrix	S_0	LOQ
Ground beef	0	0
Milk	0	0
Green beans	0	0
Fish terrine	0	0
Liquid egg	0	0
Dog pâté	0	0

3.1.4 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.

For the initial validation (2006), 31 target strains and 21 non-target strains were tested in duplicate on PCA, VRBG and with the TEMPO EB method.

19 additional target strains and 9 non-target strains were tested in 2018 once on PCA, VRBG and with the TEMPO EB method.

The raw data are provided in **Appendix 9**.

> **Inclusivity**

Same results were observed by both methods for 48 strains. For 2 strains, differences were observed:

- *Citrobacter diversus* CIP 8594 was not able to grow on VRBG plates but was enumerated by the TEMPO EB method.
- *Rhanella aquatilis* 69 was not enumerated by both methods.

> **Exclusivity**

Among the 30 non-target strains tested, 27 strains were not enumerated with the TEMPO EB method and 25 strains were not able to grow on VRBG plates.

3 strains were enumerated by both methods: *Stenotrophomonas maltophilia* CIP 6077, *Stenotrophomonas maltophilia* 112 and *Plesiomonas shigelloïdes* Ad673.

2 strains were enumerated only on VRBG plates but showed non-characteristic colonies: *Acinetobacter baumannii* Ad1090 and *Pandoraea* sp. Ad1882.

The TEMPO EB method is as specific and selective as the reference method.

3.1.5 *Practicability*

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

Storage conditions, shelf-life and modalities of utilisation after first use	The storage temperatures are between 2 and 25°C (room temperature before analysis) depending on the materials and the reagents.		
Time to result	Steps	Reference method	Alternative method
	Sample analysis	Day 0	Day 0
	Enumeration	Day 1	Day 1
	Confirmation	Day 3	/
Common step with the reference method	Preparation of the initial suspension		

The results are obtained in one day with the TEMPO EB method while 3 days are required for the ISO 21528-2 method if colonies are present on the VRBG plates.

3.2 Inter-laboratory study organisation and results

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 organisation

12 laboratories participated to this study in 2006. Detailed instructions were sent to the collaborators by the expert laboratory.

Pasteurised half-skimmed milk was inoculated with *Escherichia coli* 94 strain, isolated from dairy product.

The inoculation levels targeted were:

- level 0: <10 CFU/ml,
- level 1: 100 – 1 000 CFU/ml,
- level 2: 1 000 – 10 000 CFU/ml,
- level 3: 10 000 – 100 000 CFU/ml.

Each laboratory received eight flasks of 25 ml sample, i.e. two flasks per inoculation level. Furthermore, one non-inoculated sample was added to the package for total viable count (NF ISO 4833 method).

Blind samples were placed in isothermal boxes and delivered to the different laboratories. A probe was added to the package in order to register the temperature profile during the delivery. Samples were shipped in 24 h to laboratories. Sample temperature should be lower or equal to 8°C during delivery, and between 0°C - 8°C at receipt.

The collaborators and the expert laboratory performed the analyses with the alternative and reference methods.

3.2.2 Experimental parameters controls

3.2.2.1 Sample stability

In order to evaluate the *Escherichia coli* 94 strain behaviour during transport, bacterial counts were done at different time, i.e. inoculation time, after 24 h and 48 h of storage at 2°C. Results are reported in Table 9.

Table 9 - *Escherichia coli* 94 count with the ISO 21528-2 method
(in log CFU/ml)

	Level 1		Level 2		Level 3	
	Duplicate 1	Duplicate 2	Duplicate 1	Duplicate 2	Duplicate 1	Duplicate 2
Day 0	100	140	900	850	9 300	7 500
Day 1	100	70	740	570	8 800	7 700
Day 2	70	60	750	750	7 800	5 900

No evolution of the strain was observed after 48 h storage at 5°C ± 3°C.

3.2.3 Logistic conditions

The temperatures measured at reception by the Labs, the temperatures registered by the thermo-probe, and the receipt dates are given in Table 10.

Table 10 - Sample temperatures at receipt

Laboratories	Measured temperature on receipt (°C)	Date of sample arrival		Temperature measured by the probe (°C)
A	3.0	26/09/06	09h10	2.0
B	14.0	27/09/06	09h50	12.0
C	3.1	26/09/06	10h15	0.5
D	1.0	26/09/06	09h00	0.5
E	3.6	26/09/06	08h15	0.0
F	1.0	26/09/06	08h00	0.5
G	1.1	26/09/06	09h30	0.5
H	13.2	27/09/06	11h00	13.5
I	15.1	27/09/06	10h00	14.0
J	17.8	27/09/06	15h30	16.5
K	13.2	26/09/06	13H30	4.5
L	<i>This laboratory did not participate to the study.</i>			
M	3.7	26/09/06	11h00	1.5

The packages were received on 06/09/26 by 8 laboratories: labs A, C, D, E, F, G, K and M. The lab K measured a temperature of 13.2°C at receipt while the temperature measured by the probe was 4.5°C.

Four labs received the packages on 06/09/27, with temperature at receipt higher than 8.4°C: labs B, H, I and J.

Growth simulations of the *E. coli* 94 strain were realised with the Sym'Previus¹ software, according to:

- The pH, temperature and a_w cardinal values of *E. coli* strains from the SYM'PREVIUS database,
- The milk physicochemical parameters (pH and a_w)
- The temperature checked by the probe.

For the lab H, the temperature was higher than 8.4°C during a short time. The simulation shows a low bacterial growth, lower than 0.15 Log CFU/g. The lab H data were thus taken into account in the statistical interpretations.

3.2.4 Result analysis

3.2.4.1 Results obtained by the expert Lab.

The results obtained by the expert Lab. are the following (See Table 11).

Table 11 – Results obtained by the expert Lab. (log CFU/ml)

Level	Reference method	Alternative method
L0	< 1 / < 1	< 1 / < 1
L1	1.91 / 1.81	1.77 / 2.15
L2	2.75 / 2.74	3.04 / 2.91
L3	3.88 / 3.88	4.08 / 3.96

¹ <http://www.symprevius.net>

3.2.4.2 Results obtained by the collaborators

> *Mesophilic aerobic microflora*

The mesophilic aerobic microflora was done on the matrix with ISO 4833 method. The results varied from < 10 to 6 CFU/ml.

> *Enterobacteriaceae enumeration*

A summary of the test results is given in Table 12 (CFU/ml) and Table 13 (log CFU/ml).

Table 12 - Summary of data (CFU/ml)

Lab.	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	<10	<10	<10	<10	110	75	45	86	710	740	730	930	9000	7900	15000	6800
C	<10	<10	<10	<10	85	80	59	10	840	790	730	390	9100	9200	6800	11000
D	<10	<10	<10	<10	75	65	83	120	600	540	710	640	9500	8100	11000	11000
E	<10	<10	<10	<10	65	40	68	83	570	500	520	810	7400	7800	9100	9100
F	<10	<10	<10	<10	80	120	<10	100	820	910	530	950	8400	7600	12000	6700
G	<10	<10	<10	<10	120	65	89	57	810	820	360	810	9600	9200	6000	6000
H	<10	<10	<10	<10	65	80	57	83	660	1000	480	400	8000	6100	6000	6800
K	<10	<10	<10	<10	90	150	200	140	1200	1200	2100	1300	14000	12000	30000	15000
M	<10	<10	<10	<10	140	110	59	86	810	930	1400	1100	10000	8300	11000	12000

Table 13 - Summary of data (log CFU/ml)

Lab.	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	/	/	/	/	2,041	1,875	1,653	1,934	2,851	2,869	2,863	2,968	3,954	3,898	4,176	3,833
C	/	/	/	/	1,929	1,903	1,771	1,000	2,924	2,898	2,863	2,591	3,959	3,964	3,833	4,041
D	/	/	/	/	1,875	1,813	1,919	2,079	2,778	2,732	2,851	2,806	3,978	3,908	4,041	4,041
E	/	/	/	/	1,813	1,602	1,833	1,919	2,756	2,699	2,716	2,908	3,869	3,892	3,959	3,959
F	/	/	/	/	1,903	2,079	<1,00	2,000	2,914	2,959	2,724	2,978	3,924	3,881	4,079	3,826
G	/	/	/	/	2,079	1,813	1,949	1,756	2,908	2,914	2,556	2,908	3,982	3,964	3,778	3,778
H	/	/	/	/	1,813	1,903	1,756	1,919	2,820	3,000	2,681	2,602	3,903	3,785	3,778	3,833
K	/	/	/	/	1,954	2,176	2,301	2,146	3,079	3,079	3,322	3,114	4,146	4,079	4,477	4,176
M	/	/	/	/	2,146	2,041	1,771	1,934	2,908	2,968	3,146	3,041	4,000	3,919	4,041	4,079

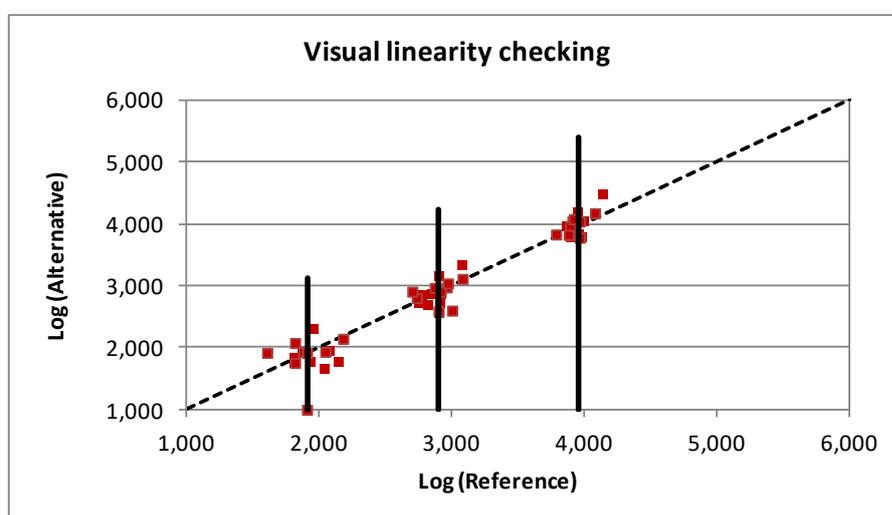
3.2.5 Calculation and interpretation

3.2.5.1 Visual linearity checking

The figure 10 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.

For level 1, the results from Lab F can't be taken into account as no colony was enumerated for one sample. Only 8 data sets are thus available for this inoculation level.

Figure 10 - Visual linearity checking



3.2.5.2 Accuracy profile calculation

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 14.

Table 14 - Summary of statistical tests

Accuracy profile		0,5		
Study Name	TEMPO EB			
Date	2006			
Coordinator	ADRIA Développement			
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.

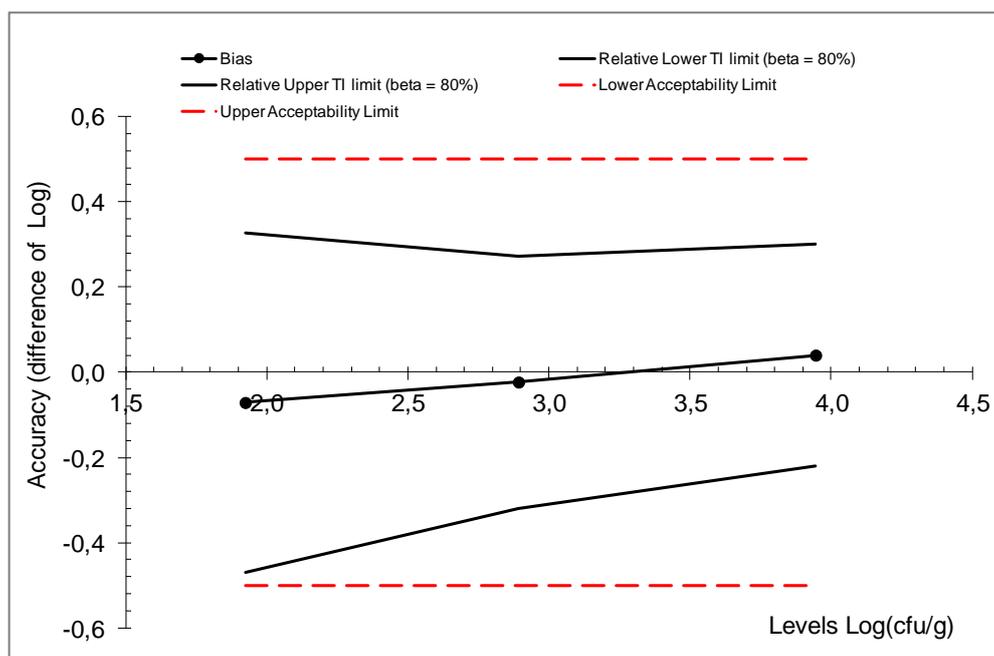
Levels	Alternative method			Reference method		
	Low	Medium	High	Low	Medium	High
Target value	1,924	2,892	3,945			
Number of participants (K)	8	9	9	8	9	9
Average for alternative method	1,853	2,869	3,985	1,924	2,892	3,945
Repeatability standard deviation (sr)	0,227	0,144	0,133	0,116	0,050	0,045
Between-labs standard deviation (sL)	0,170	0,153	0,129	0,093	0,098	0,069
Reproducibility standard deviation (sR)	0,283	0,210	0,186	0,149	0,110	0,082
Corrected number of dof	12,683	12,608	13,120	12,384	9,813	10,721
Coverage factor	1,408	1,409	1,404			
Interpolated Student t	1,352	1,353	1,350			
Tolerance interval standard deviation	0,2949	0,2188	0,1933			
Lower TI limit	1,454	2,573	3,724			
Upper TI limit	2,251	3,165	4,246			
Bias	-0,071	-0,023	0,040			
Relative Lower TI limit (beta = 80%)	-0,470	-0,319	-0,221			
Relative Upper TI limit (beta = 80%)	0,328	0,273	0,301			
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	0,117
--	-------

These values are collected in a graphical representation together with the acceptability limits (AL). This representation is given Figure 11.

Figure 11 - 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 results obtained with the alternative method are not statically different than those obtained with the reference method.

3.2.5.3 Conclusion

The alternative method is equivalent to the reference method.

4 GENERAL CONCLUSION

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

- 140 samples were tested in the relative trueness study, providing 100 interpretable results by both methods which clearly satisfied the required criteria for quantitative method comparison per ISO 16140-2:2016.
- The observed profiles are in most of the cases comprised within the Acceptability Limit fixed at ± 0.5 Log CFU/g in the EN ISO 16140-2:2016.
- The inclusivity and exclusivity testing shows satisfying results.
- The results are obtained in one day with the TEMPO EB method while 3 days are required for the ISO 21528-2 method if colonies are present on the VRBG plates.
- The quality assurance parameters were verified (strain stability, logistic conditions, analyses), confirming that the inter-laboratory study was conducted in appropriate conditions.
- 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 alternative method is considered equivalent to the reference method.

Quimper, 03 November 2022

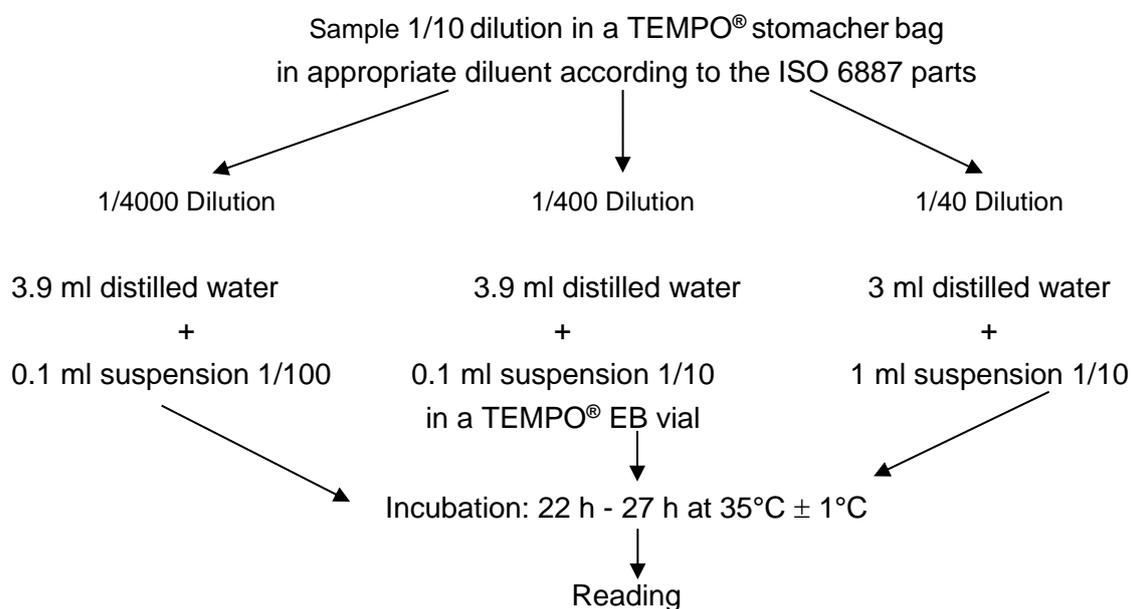
Maryse RANNOU

Project Manager

Validation of Alternative methods

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: TEMPO EB

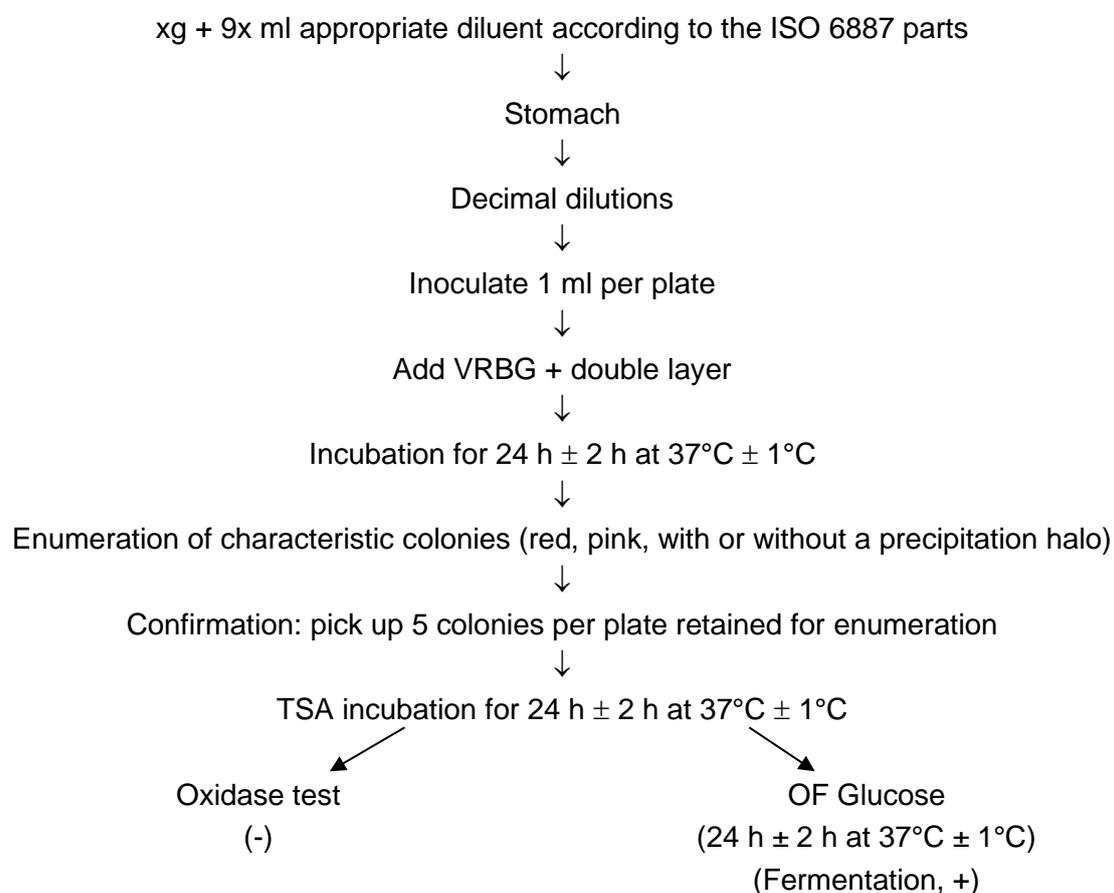


The 1/40 dilution allows 10 to 49 000 cfu/g enumeration

The 1/400 dilution allows 100 to 490 000 cfu/g enumeration

The 1/4000 dilution allows 1 000 to 4 900 000 cfu/g enumeration.

**Appendix 2 – Flow diagram of the reference method: ISO 21528-2 (June 2017) -
Microbiology of the food chain - Horizontal method for detection and
enumeration of *Enterobacteriaceae* - Part 2: Colony-count technique**



Appendix 3 – Artificial contaminations of samples

Year of analysis	N° Sample	French name product	English name product	Artificial contaminations				Category	Type
				Strain	Origin	Injury protocol	Injury measurement		
2018	7248	Poudre de lait écrémé	Skim milk powder	<i>Escherichia coli</i> Ad1422	Dairy product	HT 5 min 56°C	0,6	2	c
2018	7249	Poudre de lait demi écrémé	Half skim milk powder	<i>Escherichia coli</i> Ad1422	Dairy product	HT 5 min 56°C	0,6	2	c
2018	7250	Poudre de lait (calcium)	Milk powder	<i>Escherichia coli</i> Ad1422	Dairy product	HT 5 min 56°C	0,6	2	c
2018	8539	Poudre de lait écrémé	Milk powder	<i>Cronobacter sakazakii</i> Ad916	Milk powder	HT 5 min 56°C	0,9	2	c
2018	8540	Poudre de lait demi écrémé	Milk powder	<i>Cronobacter sakazakii</i> Ad916	Milk powder	HT 5 min 56°C	0,9	2	c
2018	7077	Choux-fleurs surgelés	Frozen cauliflower	<i>Klebsiella pneumoniae</i> 139	Vegetables	Seeding 48h at 3±2°C	/	3	a
2018	7226	Petits pois surgelés	Frozen peas	<i>Pantoea agglomerans</i> 117	Vegetables	Seeding 48h at 3±2°C	/	3	a
2018	7078	Cœurs d'artichauts marinés	Marinated artichoke heart	<i>Escherichia hermannii</i> Ad457	Vegetables	Seeding 48h at 3±2°C	/	3	c
2018	7225	Gratin de choux fleurs	RTRH cauliflower gratin	<i>Serratia ficaria</i> 113	Vegetables	Seeding 48h at 3±2°C	/	3	c
2018	7079	Filets de maquereaux fumés	Smoked fish fillets	<i>Enterobacter cloacae</i> Ad230	Fish	Seeding 48h at 3±2°C	/	4	b
2018	7080	Filets de harengs fumés	Smoked fish fillets	<i>Enterobacter cloacae</i> Ad230	Fish	Seeding 48h at 3±2°C	/	4	b
2018	7081	Truite fumée	Smoked salmon	<i>Citrobacter braakii</i> Ad2701	Seafood	Seeding 48h at 3±2°C	/	4	b
2018	7082	Mayonnaise fraîche	Mayonnaise	<i>Citrobacter freundii</i> Ad1326	Egg product	Seeding 48h at 3±2°C	/	5	b
2018	7251	Croquettes pour chiens	Low moisture dog food	<i>Enterobacter aerogenes</i> Ad889	Feed product	HT 5 min 56°C	1,0	6	a
2018	7252	Croquettes pour chats	Low moisture cat food	<i>Enterobacter aerogenes</i> Ad889	Feed product	HT 5 min 56°C	1,0	6	a

Appendix 4 - Relative trueness study: raw data

a: dilution 1/40

b: dilution 1/400

*: < 4 CFU/plate

MEAT AND MEAT PRODUCTS																								
Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*										Alternative method: TEMPO EB					Category	Type			
					Replicate 1		Replicate 2		Replicate 1		Replicate 2		Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2			Replicate 1	Replicate 2	Kept for the renewal
					Before confirmation				After confirmation															
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g			Result	Result	log cfu/g
2006	562	Sauté de veau	Raw veal meat	100	137	125	115	87	137	125	115	87	13000	9900	4,11	4,00	4,11	15000	9100	4,18	3,96	4,18	1 a	
				1000	7	11	10	6	7	11	10	6						a	a					
2006	563	Paupiette de veau	Raw veal meat	10	28	20	37	39	28	20	37	39	240	360	2,38	2,56	2,38	480	300	2,68	2,48	2,68	1 a	
				100	3	1	1	2	3	1	1	2						a	a					
2006	564	Paupiette de veau	Raw veal meat	10	26	18	25	23	26	18	25	23	220	220	2,34	2,34	2,34	180	260	2,26	2,41	2,26	1 a	
				100	4	0	1	0	4	0	1	0						a	a					
2006	565	Pointes (viande)	Raw meat	10	ND								ND	ND	ND	ND	ND	>490000	>490000	>5,69	>5,69	>5,69	1 a	
				100																b	b			
2006	566	Viande blanche	Raw meat	10	ND								ND	ND	ND	ND	ND	>490000	>490000	>5,69	>5,69	>5,69	1 a	
				100																b	b			
2006	589	Steack tartare	Raw beef meat	10	79	99	86	93	79	99	86	93	870	890	2,94	2,95	2,94	1400	390	3,15	2,59	3,15	1 a	
				100	6	8	12	5	6	8	12	5							a	a				
2006	590	Saucisse	Sausages	100	17	23	19	17	17	23	19	17	1800	1800	3,26	3,26	3,26	900	1200	2,95	3,08	2,95	1 b	
				1000	0	0	1	3	0	0	1	3							a	a				
2006	591	Saucisse	Sausages	10	35	40	25	42	35	40	25	34	370	280	2,57	2,45	2,57	120	210	2,08	2,32	2,08	1 b	
				100	3	4	0	2	3	4	0	2							a	a				
2006	592	Chair à saucisse	Sausages	10	42	62	57	78	42	62	57	78	510	650	2,71	2,81	2,71	730	350	2,86	2,54	2,86	1 b	
				100	5	4	3	4	5	4	3	4							a	a				
2006	595	Porc à l'ananas	RTRH meat product (pork)	100	ND								ND	ND	ND	ND	ND	>490000	>490000	>5,69	>5,69	>5,69	1 c	
				1000																b	b			
2006	596	Viande blanche	Raw meat	1000	4	2	8	7	4	2	8	7	3000	7500	3,48	3,88	3,48	6800	6300	3,83	3,80	3,83	1 a	
				10000	0	0	0	0	0	0	0	0	Ne	Ne						b	b			
2006	628	Viande de porc	Raw pork meat	10000	>150	>150	>150	>150	>150	>150	>150	>150	2900000	3300000	6,46	6,52	6,46	1700000	1500000	6,23	6,18	6,23	1 a	
				100000	33	24	28	38	33	24	28	38	N'	N'						c	c			
2006	632	Côte de porc	Pork raw meat	100	61	48	59	76	61	48	59	76	5500	6600	3,74	3,82	3,74	15000	9100	4,18	3,96	4,18	1 a	
				1000	7	5	6	5	7	5	6	5							a	a				
2006	633	Andouille	Delicatessen	1000	21	22	29	17	21	22	29	17	20000	24000	4,30	4,38	4,30	37000	28000	4,57	4,45	4,57	1 b	
				10000	1	1	3	3	1	1	3	3							b	b				
2006	634	Saucisson à l'ail	Delicatessen	100	7	5	6	4	7	5	6	4	550	500	2,74	2,70	2,74	990	1000	3,00	3,00	3,00	1 b	
				1000	0	0	0	0	0	0	0	0	Ne	Ne						b	b			
2006	635	Saucisse	Sausages	100	29	40	28	41	29	40	28	41	3400	3300	3,53	3,52	3,53	2700	3100	3,43	3,49	3,43	1 b	
				1000	2	3	2	2	2	3	2	2							a	a				
2006	636	Porc au piments	RTRH meat product (pork)	100	47	65	50	64	47	65	50	64	5800	5500	3,76	3,74	3,76	7800	3700	3,89	3,57	3,89	1 c	
				1000	7	8	4	2	7	8	4	2							a	a				
2006	638	Merguez	Merguez	1000	78	65	62	61	78	65	62	61	72000	63000	4,86	4,80	4,86	91000	91000	4,96	4,96	4,96	1 b	
				10000	6	10	5	10	6	10	5	10							b	b				
2006	639	Escalope de dinde	Turkey raw meat	100	128	86	122	115	128	86	122	115	11000	12000	4,04	4,08	4,04	37000	7900	4,57	3,90	4,57	1 a	
				1000	17	8	19	15	17	8	19	15							b	b				
2006	640	Escalope de poulet	Chicken raw meat	1000	12	9	14	7	12	9	14	7	10000	11000	4,00	4,04	4,00	8800	9300	3,94	3,97	3,94	1 a	
				10000	1	0	1	0	1	0	1	0	Ne	Ne						b	b			
2006	641	Steak de cheval	Horse raw meat	10	>150	>150	>150	50	>150	>150	>150	50	3500	2900	3,54	3,46	3,54	9100	4400	3,96	3,64	3,96	1 a	
				100	27	43	18	39	27	43	18	39	N'	N'						a	a			
2006	642	Bouchée à la reine	RTRH meat product	10	>150	>150	>150	>150	>150	>150	>150	>150	1300	1300	3,11	3,11	3,11	1700	1100	3,23	3,04	3,23	1 c	
				100	9	16	14	12	9	16	14	12	N'	N'						a	a			
2018	6684	Aiguillettes de poulet et semoule aux fruits secs	RTRH meat product (chicken)	100	26				26				2800		3,45		3,45	180		2,26		2,26	1 c	
				1000	5				5															
2018	6685	Filet de poulet cubes (cuit)	Cooked chicken fillet	10	6				6				60		1,78		1,78	45		1,65		1,65	1 c	
				100	0				0															

* Analyses performed according to the COFRAC accreditation

MEAT AND MEAT PRODUCTS

Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*										Alternative method: TEMPO EB					Category	Type			
					Replicate 1		Replicate 2		Replicate 1		Replicate 2		Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2			Replicate 1	Replicate 2	Kept for the renewal
					Before confirmation				After confirmation															
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g	Result	Result			log cfu/g	log cfu/g	
2018	6686	Cubes de poulet rôti	Cooked roast chicken	10	34				34				420		2,62		2,62	31		1,49		1,49	1	c
				100	12				12															
2018	6694	Hachis parmentier	RTRH meat product (shepherd's pie)	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	1	c
				100	0				0															

DAIRY PRODUCTS																									
Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*										Alternative method: TEMPO EB					Category	Type				
					Replicate 1		Replicate 2		Replicate 1		Replicate 2		Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2			Replicate 1	Replicate 2	Kept for the renewal	
					Before confirmation				After confirmation																
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g			Result	Result	log cfu/g	log cfu/g
2006	725	Lait cru	Raw milk	100	>150	>150	>150	>150	>150	>150	>150	>150	>150	26000	24000	4,41	4,38	4,41	37000	30000	4,57	4,48	4,57	2 a	
				1000	29	22	25	22	29	22	25	22	N'	N'							a	a			
2006	726	Rocamadour	Cheese	100	22	29	25	27	22	29	25	27	2500	2600	3,40	3,41	3,40	4000	2200	3,60	3,34	3,60	2 b		
				1000	0	4	4	1	0	4	4	1								a	a				
2006	727	Mozarella	Cheese	100	>150	>150	>150	>150					ND	ND	ND	ND	ND	370000	370000	5,57	5,57	5,57	2 b		
				1000	>150	>150	>150	>150												b	b				
2006	824	Lait cru	Raw milk	100	15	23	17	16	15	23	17	16	1900	1600	3,28	3,20	3,28	1800	1800	3,26	3,26	3,26	2 a		
				1000	2	2	2	0	2	2	2	0								a	a				
2006	825	Mozarella	Cheese	1000	>150	>150	>150	>150	>150	>150	>150	>150	1300000	1000000	6,11	6,00	6,11	>490000	>490000	>5,69	>5,69	>5,69	2 b		
				10000	1137	132	90	118	137	132	90	118	N'	N'						b	b				
2006	842	Lait cru	Raw milk	10000	99	85	110	75	99	85	110	75	970000	970000	5,99	5,99	5,99	2100000	2500000	6,32	6,40	6,32	2 a		
				100000	13	16	15	13	13	16	15	13								c	c				
2006	847	Crottin de chèvre	Cheese	10000	>150	>150	>150	>150					ND	ND	ND	ND	ND	>4900000	>4900000	>5,69	>5,69	>5,69	2 b		
				100000	>150	>150	>150	>150												c	c				
2006	848	Crottin de chèvre	Cheese	10000	>150	>150	>150	>150					ND	ND	ND	ND	ND	>4900000	>4900000	>5,69	>5,69	>5,69	2 b		
				100000	>150	>150	>150	>150												c	c				
2006	879	Crottin de chèvre	Cheese	100	137	150	165	139	137	150	165	139	14000	15000	4,15	4,18	4,15	25000	21000	4,40	4,32	4,40	2 b		
				1000	8	11	13	9	8	11	13	9								a	a				
2006	880	Lait cru	Raw milk	1000	30	26	39	19	30	26	39	19	27000	30000	4,43	4,48	4,43	37000	37000	4,57	4,57	4,57	2 a		
				10000	2	1	6	3	2	1	6	3								a	a				
2006	1000	Poudre de lait	Milk powder	1000	8	6	10	12	8	6	10	12	7000	11000	3,85	4,04	3,85	4800	4000	3,68	3,60	3,68	2 c		
				10000	0	0	0	1	0	0	0	0	Ne	Ne						b	b				
2006	1001	Poudre de lait	Milk powder	1000	1	0	2	2	1	0	1	0	500	500	2,70*	2,70*	2,70*	1400	2100	3,15	3,32	3,15	2 c		
				10000	0	0	0	0	0	0	0	0								b	c				
2006	1002	Leerdamer	Cheese	1000	36	21	31	21	36	21	31	21	29000	28000	4,46	4,45	4,46	37000	60000	4,57	4,78	4,57	2 b		
				10000	5	2	7	2	5	2	7	2								b	b				
2006	1003	Camembert	Cheese	1000	35	32	40	37	35	32	40	37	37000	37000	4,57	4,57	4,57	78000	60000	4,89	4,78	4,89	2 b		
				10000	6	8	3	1	6	8	3	1								b	b				
2006	1006	Reblochon	Cheese	1000	26	13	22	14	26	13	22	14	21000	19000	4,32	4,28	4,32	50000	24000	4,70	4,38	4,70	2 b		
				10000	4	4	1	4	4	4	1	4								b	b				
2018	6863	Lait cru fermier	Raw milk	1000	20				20				18000		4,26		4,26	49000		4,69		4,69	2 a		
				10000	0				0																
2018	7248	Poudre de lait écrémé	Skim milk powder	10	118				118				1100		3,04		3,04	2100		3,32		3,32	2 c		
				100	7				7																
2018	7249	Poudre de lait demi écrémé	Half skim milk powder	1000	19				19				20000		4,30		4,30	37000		4,57		4,57	2 c		
				10000	3				3																
2018	7250	Poudre de lait (calcium)	Milk powder	100	98				98				10000		4,00		4,00	25000		4,40		4,40	2 c		
				1000	13				13																
2018	8539	Poudre de lait écrémé	Milk powder	100	44				44				4300		3,63		3,63	6700		3,83		3,83	2 c		
				1000	3				3																
2018	5840	Poudre de lait demi écrémé	Milk powder	100	53				53				5100		3,71		3,71	6000		3,78		3,78	2 c		
				1000	3				3																

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VEGETABLES																													
Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*											Alternative method: TEMPO EB					Category	Type							
					Replicate 1				Replicate 2				Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2	Replicate 1			Replicate 2	Kept for the renewal					
					Before confirmation				After confirmation																				
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g	Result	Result	log cfu/g			log cfu/g						
2006	561	Epinards à la béchamel	Spinach with bechamel	100	ND											ND	ND	ND	ND	ND	>490000	>490000	>5,69	>5,69	>5,69	3	c		
				1000																									
2006	593	Piémontaise	RTE salad	10	29	52	50	50	29	52	50	50	410	510	2,61	2,71	2,61	250	300	2,40	2,48	2,40	3	c					
				100	6	4	4	8	6	4	4	8					a	a											
2006	627	Choux bruxelles	Brussels sprouts	10	3	1	0	0	3	1	0	0	20	<10	1,30*	<1,00	1,30*	45	44	1,65	1,64	1,65	3	a					
				100	0	0	0	0	0	0	0	0					a	a											
2006	629	Haricots verts	Green beans	10	38	70	37	70	38	70	37	70	530	530	2,72	2,72	2,72	86	100	1,93	2,00	1,93	3	a					
				100	2	6	4	5	2	6	4	5					a	a											
2006	630	Courgettes	Zucchini	10	20	17	20	15	20	17	20	15	170	160	2,23	2,20	2,23	10	<10	1,00	<1,00	1,00	3	a					
				100	1	0	0	1	1	0	0	1					a	a											
2006	631	Poêlée légumes champignons	Fried vegetables	10	0	0	0	0	0	0	0	0	<10	<10	<1,00	<1,00	<1,00	<100	<100	<2,00	<2,00	<2,00	3	a					
				100	0	0	0	0	0	0	0	0					b	b											
2006	844	Carottes rapées	Sliced carrots	10	2	3	3	4	2	3	3	4	25	35	1,40*	1,54*	1,40*	45	120	1,65	2,08	1,65	3	b					
				100	0	0	0	0	0	0	0	0					a	a											
2006	845	Céleri rémoulade	RTE salad (celery)	1000	36	31	31	40	36	31	31	40	34000	39000	4,53	4,59	4,53	43000	55000	4,63	4,74	4,63	3	c					
				10000	4	4	7	7	4	4	7	7					b	a											
2006	877	Carottes rapées	Unseasoned sliced carrots	10000	>150	>150	>150	>150					ND	ND	ND	ND	ND	>4900000	>4900000	>5,69	>5,69	>5,69	3	b					
				100000	>150	>150	>150	>150										c	c										
2006	878	Chou rouge	Red cabbage	10000	80	73	123	74	80	44	123	74	630000	950000	5,80	5,98	5,80	490000	550000	5,69	5,74	5,69	3	b					
				100000	11	5	9	6	9	5	7	6					b	c											
2006	947	Julienne de légumes	Sliced vegetables	100	16	25	27	16	16	25	27	16	2000	2200	3,30	3,34	3,30	970	1100	2,99	3,04	2,99	3	a					
				1000	2	2	2	3	2	2	2	3					a	a											
2006	1014	Tomates en dés	Diced tomatoes	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<2,00	<2,00	<2,00	32	<10	1,51	<1,00	1,51	3	a					
				1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000					a	a											
2006	1084	Salade provençale	RTE salad	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<2,00	<2,00	<2,00	<10	<10	<1,00	<1,00	<1,00	3	c					
				1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000					a	a											
2006	1085	Macédoine de légumes	Mix vegetables	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<2,00	<2,00	<2,00	<10	<10	<1,00	<1,00	<1,00	3	a					
				1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000					a	a											
2018	6687	Epinards à la crème	Creamed spinach	10	23				23				220		2,34		2,34	220		2,34		2,34	3	c					
				100	1				1																				
2018	6688	Ciboulette	Chive	100	22				22				2100		3,32		3,32	360		2,56		2,56	3	b					
				1000	1				1																				
2018	6689	Purée de pomme de terre	Mashed potatoes	100	7				7				700		2,85		2,85	1900		3,28		3,28	3	c					
				1000	2				2						Ne		Ne												
2018	6864	Emincés de poireaux surgelés	Frozen sliced leeks	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	3	a					
				100	0				0																				
2018	6865	Duo de carottes surgelées	Frozen carrots	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	3	a					
				100	0				0																				
2018	6866	Poêlée de trois légumes surgelée	Frozen fried vegetables	10	5				5				50		1,70		1,70	21		1,32		1,32	3	a					
				100	0				0						Ne		Ne												
2018	6871	Macédoine aux légumes	RTE salad (macedoine)	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	3	c					
				100	0				0																				
2018	7077	Choux-fleurs surgelés	Frozen cauliflower	100	62				62				6500		3,81		3,81	12000		4,08		4,08	3	a					
				1000	10				10																				
2018	7078	Cœurs d'artichauts marinés	Marinated artichoke heart	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	3	c					
				100	0				0																				
2018	7083	Printanière de légumes surgelée	Frozen spring vegetables	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	3	a					
				100	0				0																				
2018	7084	Carottes râpées	Grated carrots	10000	20				20				180000		5,26		5,26	17000		4,23		4,23	3	b					
				100000	0				0																				
2018	7085	Mélange de crudités (salade, carotte, chou)	Unseasoned RTE vegetables	1000	129				129				130000		5,11		5,11	140000		5,15		5,15	3	b					
				10000	11				11																				

* Analyses performed according to the COFRAC accreditation

VEGETABLES

Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*											Alternative method: TEMPO EB					Category	Type		
					Replicate 1		Replicate 2		Replicate 1		Replicate 2		Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2	Replicate 1			Replicate 2	Kept for the renewal
					Before confirmation				After confirmation															
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g	Result	Result	log cfu/g			log cfu/g	
2018	7086	Mélange de crudités (chou, carotte, céleri)	Unseasoned RTE vegetables	100	135				135				13000		4,11		4,11	17000		4,23		4,23	3 b	
				1000	10				10															
2018	7224	Concombre au fromage blanc	RTE salad (cucumber)	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	3 c	
				100	0				0															
2018	7225	Gratin de choux fleurs	RTRH cauliflower gratin	100	15				15				1400		3,15		3,15	3400		3,53		3,53	3 c	
				1000	0				0															
2018	7226	Petits pois surgelés	Frozen peas	10	134				134				1400		3,15		3,15	6700		3,83		3,83	3 a	
				100	23				23															

FISH AND SEAFOOD																								
Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*										Alternative method: TEMPO EB					Category	Type			
					Replicate 1		Replicate 2		Replicate 1		Replicate 2		Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2			Replicate 1	Replicate 2	Kept for the renewal
					Before confirmation				After confirmation															
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g	Result	Result			log cfu/g	log cfu/g	
2006	637	Gambas aux légumes	RTRH seafood product (prawns)	100	116	122	86	99	116	122	86	99	12000	9300	4,08	3,97	4,08	14000	95000	4,15	4,98	4,15	4	c
				1000	13	9	11	8	13	9	11	8												
2006	843	Terrine de saumon	Salmon terrine	10	26	20	16	20	26	20	16	20	220	200	2,34	2,30	2,34	120	200	2,08	2,30	2,08	4	c
				100	1	1	4	4	1	1	4	4												
2006	846	Saumon fumé	Smoked salmon	10	3	2	5	1	3	2	5	1	25	30	1,40*	1,48*	1,48*	<10	27	<1	1,43	1,43	4	b
				100	0	0	0	0	0	0	0	0												
2006	886	Terrine de poisson	Fish terrine	10	19	19	20	12	19	19	20	12	180	160	2,26	2,20	2,26	440	330	2,64	2,52	2,64	4	c
				100	1	1	2	2	1	1	2	2												
2006	944	Saumon fumé	Smoked salmon	100	103	64	99	86	103	64	99	86	8500	9000	3,93	3,95	3,93	9100	7800	3,96	3,89	3,96	4	b
				1000	13	8	5	9	13	8	5	9												
2006	945	Cocktail de fruits de mer	Seafood cocktail	10	7	8	5	2	7	8	5	2	75	35	1,88	1,54	1,88	210	330	2,32	2,52	2,32	4	a
				100	0	4	0	0	0	4	0	0												
2006	946	Loup de mer	Fish	10	0	0	0	0	0	0	0	0	<10	<10	<1,00	<1,00	<1,00	<10	<10	<1,00	<1,00	<1,00	4	a
				100	0	0	0	0	0	0	0	0												
2006	1083	Thon	Tuna	1000	>150	>150	>150	>150	>150	>150	>150	>150	>1500000	>1500000	>6,18	>6,18	>6,18	>490000	>490000	>5,69	>5,69	>5,69	4	a
				10000	>150	>150	>150	>150	>150	>150	>150	>150												
2018	6690	Chair de moules cuites	Cooked mussels meat	10	7				7				70		1,85		1,85	<10		<1,00		<1,00	4	c
				100	0				0															
2018	6691	Saumon sauvage congelé	Frozen wild salmon	10	117				117				1100		3,04		3,04	380		2,58		2,58	4	a
				100	7				7															
2018	6692	Tranche de colin poêlé	Fried fish	10	35				35				340		2,53		2,53	130		2,11		2,11	4	c
				100	2				2															
2018	6693	Petit poisson pané	Breaded fish	10	76				76				740		2,87		2,87	810		2,91		2,91	4	c
				100	5				5															
2018	6695	Salade de lentilles au saumon fumé	RTE salad (smoked salmon)	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	4	c
				100	0				0															
2018	6696	Merlu	Raw fish	100	32				32				3200		3,51		3,51	700		2,85		2,85	4	a
				1000	3				3															
2018	6697	Filet de plie	Raw fish fillet	1000	25				25				24000		4,38		4,38	12000		4,08		4,08	4	a
				10000	1				1															
2018	6867	Filets de harengs fumés	Smoked fish fillets	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	4	b
				100	0				0															
2018	6868	Haddock fumé	Smoked fish	10	10				10				91		1,96		1,96	21		1,32		1,32	4	b
				100	0				0															
2018	6869	Saumon fumé	Smoked salmon	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	4	b
				100	0				0															
2018	7079	Filets de maquereaux fumés	Smoked fish fillets	10	29				29				280		2,45		2,45	140		2,15		2,15	4	b
				100	2				2															
2018	7080	Filets de harengs fumés	Smoked fish fillets	100	13				13				1400		3,15		3,15	630		2,80		2,80	4	b
				1000	2				2															
2018	7081	Truite fumée	Smoked salmon	10	28				28				260		2,41		2,41	630		2,80		2,80	4	b
				100	0				0															
2018	7087	Filet de tacaud	Raw fish fillet	100	20				8				800		2,90		2,90	1400		3,15		3,15	4	a
				1000	1				1															

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EGG PRODUCTS																								
Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*											Alternative method: TEMPO EB					Category	Type		
					Replicate 1		Replicate 2		Replicate 1		Replicate 2		Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2	Replicate 1			Replicate 2	Kept for the renewal
					Before confirmation				After confirmation															
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g	Result			Result	log cfu/g
2006	587	Baba au rhum	Pastry	10	8	11	12	13	8	11	12	13	95	120	1,98	2,08	1,98	57	86	1,76	1,93	1,76	5	c
				100	0	1	1	0	0	1	1	0	Ne	Ne				a	a					
2006	588	Meringue au chocolat	Chocolate meringue	10	50	67	50	53	50	67	50	53	580	510	2,76	2,71	2,76	190	270	2,28	2,43	2,28	5	c
				100	2	8	2	6	2	8	2	6						a	a					
2006	728	Coule d'œuf	Liquid egg	1000	>150	>150	>150	>150					ND	ND	ND	ND	ND	>490000	>490000	>5,69	>5,69	>5,69	5	a
				10000	>150	>150	>150	>150										b	b					
2006	826	Gâteau Russe	Pastry	10	18	20	24	22	18	20	24	22	200	220	2,30	2,34	2,30	150	140	2,18	2,15	2,18	5	c
				100	3	2	2	1	3	2	2	1						a	a					
2006	827	Coule d'œuf	Liquid egg	10	26	27	28	19	26	27	28	19	270	230	2,43	2,36	2,43	160	150	2,20	2,18	2,20	5	a
				100	5	1	2	1	5	1	2	1						a	a					
2006	889	Crème d'amande	Almond cream	10	8	6	9	3	3	4	5	2	35	35	1,54*	1,54*	1,54*	33	33	1,52	1,52	1,52	5	c
				100	1	1	0	1	0	0	0	0						a	a					
2006	890	Blanc d'œuf	White liquid egg	10	5	5	0	2	3	5	0	1	40	5	1,60	0,70*	1,60	<10	10	<1,00	1,00	<1,00	5	a
				100	0	0	0	0	0	0	0	0			Ne	Ne		a	a					
2006	948	Coule d'œuf	Liquid egg	10000	>150	>150	>150	>150	>150	>150	>150	>150	>15000000	>15000000	>7,18	>7,18	>7,18	>490000	>490000	>5,69	>5,69	>5,69	5	a
				100000	>150	>150	>150	>150	>150	>150	>150	>150						b	b					
2006	949	Omelette	Tortilla	10000	>150	>150	>150	>150	>150	>150	>150	>150	>15000000	>15000000	>7,18	>7,18	>7,18	>490000	>490000	>5,69	>5,69	>5,69	5	b
				100000	>150	>150	>150	>150	>150	>150	>150	>150						b	b					
2006	950	Jaune d'œuf	Yellow liquid egg	10000	>150	>150	>150	>150	>150	>150	>150	>150	>15000000	>15000000	>7,18	>7,18	>7,18	>490000	>490000	>5,69	>5,69	>5,69	5	a
				100000	>150	>150	>150	>150	>150	>150	>150	>150						b	b					
2006	1007	Coule d'œuf	Liquid egg	10000	18	44	58	37	11	44	58	22	280000	380000	5,45	5,58	5,45	470000	680000	5,67	5,83	5,67	5	a
				100000	3	4	2	2	3	4	2	1						c	c					
2006	1008	Jaune d'œuf	Yellow liquid egg	10000	77	67	113	90	77	67	113	90	780000	1000000	5,89	6,00	5,89	820000	1200000	5,91	6,08	5,91	5	a
				100000	16	11	7	11	16	11	6	11						c	c					
2006	1009	Omelette aux champignons	Mushroom tortilla	10000	67	53	60	48	67	53	60	48	590000	550000	5,77	5,74	5,77	670000	370000	5,83	5,57	5,83	5	b
				100000	6	3	9	5	6	3	9	3						c	c					
2006	1012	Œufs brouillés	Scrambled eggs	1000	>150	>150	>150	>150	>150	>150	>150	>150	215000	160000	5,33	5,20	5,33	>490000	>490000	>5,69	>5,69	>5,69	5	b
				10000	26	17	22	10	26	17	22	10	N'	N'				b	b					
2006	1013	Blanc d'œuf	White liquid egg	1000	129	128	154	116	129	128	92	116	130000	100000	5,11	5,00	5,11	210000	250000	5,32	5,40	5,32	5	a
				10000	14	12	19	5	14	12	19	3						b	b					
2006	1086	Omelette sans sel	Tortilla	1000	15	19	44	27	15	19	44	27	18000	33000	4,26	4,52	4,26	49000	17000	4,69	4,23	4,69	5	b
				10000	4	1	2	1	4	1	0	1						a	a					
2006	1087	Omelette bio	Tortilla	1000	40	35	43	32	40	28	34	19	33000	26000	4,52	4,41	4,52	30000	49000	4,48	4,69	4,48	5	b
				10000	3	2	5	1	3	2	3	1						a	a					
2006	1088	Œufs brouillés	Scrambled eggs	1000	32	23	44	38	19	23	44	38	20000	39000	4,30	4,59	4,30	37000	37000	4,57	4,57	4,57	5	b
				10000	1	1	3	1	1	1	2	1						b	b					
2018	6698	Coule d'œuf liquide	Liquid egg product	10	125				125				1200		3,08		3,08	11000		4,04		4,04	5	a
				100	9				9															
2018	6699	Crème mousseline	Cream pastry	10	142				142				1400		3,15		3,15	2300		3,36		3,36	5	c
				100	10				10															
2018	6700	Eclair à la crème aux fraises	Pastry	100000	32				32				3000000		6,48		6,48	>4900000		>6,69		>6,69	5	c
				1000000	1				1															
2018	6870	Tortilla	Tortilla	10	0				0				<10		<1,00		<1,00	<10		<1,00		<1,00	5	b
				100	0				0															
2018	6872	Eclair à la crème aux fraises	Pastry	100000	30				30				3300000		6,52		6,52	1400000		6,15		6,15	5	c
				1000000	6				6															
2018	7082	Mayonnaise fraiche	Mayonnaise	10	42				42				410		2,61		2,61	32		1,51		1,51	5	b
				100	3				3															

* Analyses performed according to the COFRAC accreditation

PET FOOD																								
Year of analysis	N° Sample	Product (French name)	Product (English product)	Dilution	Reference method: ISO 21528-2*											Alternative method: TEMPO EB					Category	Type		
					Replicate 1		Replicate 2		Replicate 1		Replicate 2		Replicate 1	Replicate 2	Replicate 1	Replicate 2	Kept	Replicate 1	Replicate 2	Replicate 1			Replicate 2	Kept for the renewal
					Before confirmation				After confirmation															
					cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/plate a	cfu/plate b	cfu/g	cfu/g	log cfu/g	log cfu/g	log cfu/g	Result	Result	log cfu/g			log cfu/g	
2006	873	Saucisson pour animaux	Dog sausages	100	20	33	22	24	20	33	22	24	2700	2400	3,43	3,38	3,43	3100	2400	3,49	3,38	3,49	6	b
				1000	5	1	0	6	5	1	0	6												
2006	874	Bouchées pour chien	High moisture dog food	1000	>150	154	154	>150	>150	154	154	>150	170000	190000	5,23	5,28	5,23	250000	250000	5,40	5,40	5,40	6	b
				10000	15	18	20	17	15	18	20	17												
2006	875	Viande pour animaux	Raw pet food meat	100	49	67	61	59	29	54	61	59	4100	6000	3,61	3,78	3,61	5500	6000	3,74	3,78	3,74	6	c
				1000	8	4	8	4	5	3	8	4												
2006	876	Haché pour animaux	Raw minced pet food meat	10000	36	31	44	37	36	31	44	37	340000	410000	5,53	5,61	5,53	300000	490000	5,48	5,69	5,48	6	c
				100000	5	2	5	4	5	2	5	4												
2006	887	Graines pour oiseaux	Bird seeds	10	/	/	>150	>150	/	/	/	/	6700	11000	3,83	4,04	3,83	6700	4400	3,83	3,64	3,83	6	a
				100	69	53	101	52	55	42	101	122												
2006	888	Graines pour oiseaux	Bird seeds	10	42	23	21	16	0	0	0	0	<10	<10	<1,00	<1,00	<1,00	<10	<10	<1,00	<1,00	<1,00	6	a
				100	1	0	0	1	0	0	0	0												
2006	939	Saucisson pour chien	Dog sausages	100	50	44	46	58	50	44	46	58	4500	5200	3,65	3,72	3,65	5000	3100	3,70	3,49	3,70	6	b
				1000	3	2	5	6	2	2	5	6												
2006	940	Bouchées pour animaux	High moisture pet food	100	21	25	39	40	21	25	39	40	2300	3900	3,36	3,59	3,36	1200	1200	3,08	3,08	3,08	6	b
				1000	3	1	4	2	3	1	4	2												
2006	941	Pâté pour chien	High moisture dog food	1000	103	78	104	89	103	62	104	89	86000	105000	4,93	5,02	4,93	150000	250000	5,18	5,40	5,18	6	b
				10000	12	13	23	14	12	13	23	14												
2006	942	Pâté pour chat	High moisture cat food	10000	20	19	32	24	20	19	32	24	200000	270000	5,30	5,43	5,30	300000	300000	5,48	5,48	5,48	6	b
				100000	1	3	1	2	1	3	1	2												
2006	943	Croquettes pour chatons	Low moisture kitten food	100	106	105	114	111	106	63	68	67	8500	7300	3,93	3,86	3,93	6000	11000	3,78	4,04	3,78	6	a
				1000	13	4	15	10	13	4	15	10												
2018	6701	Farine d'alimentation animale	Low moisture feed meal	10	49				49				490		2,69		2,69	1000		3,00		3,00	6	a
				100	5				5															
2018	7088	Viande bovine pour animaux	Raw pet food meat	100	37				37				3600		3,56		3,56	3100		3,49		3,49	6	c
				1000	3				3															
2018	7089	Viande bovine pour animaux	Raw pet food meat	100	51				51				4800		3,68		3,68	7800		3,89		3,89	6	c
				1000	2				2															
2018	7090	Viande bovine pour animaux	Raw pet food meat	1000	38				30				27000		4,43		4,43	46000		4,66		4,66	6	c
				10000	0				0															
2018	7251	Croquettes pour chiens	Low moisture dog food	100	26				26				2700		3,43		3,43	2200		3,34		3,34	6	a
				1000	4				4															
2018	7252	Croquettes pour chats	Low moisture cat food	1000	39				39				35000		4,54		4,54	25000		4,40		4,40	6	a
				10000	0				0															

* Analyses performed according to the COFRAC accreditation

Appendix 5 - Relative trueness study: calculations

Category	N° sample	Product	Log cfu/g		Average	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	562	Raw veal meat	4,11	4,18	4,15	0,06			#N/A		#N/A	
	563	Raw veal meat	2,38	2,68	2,53	0,30			#N/A		#N/A	
	564	Raw veal meat	2,34	2,26	2,30	-0,09			#N/A		#N/A	
	565	Raw meat			#N/A			6,69	#N/A			
	566	Raw meat			#N/A			6,69	#N/A			
	589	Raw beef meat	2,94	3,15	3,04	0,21			#N/A		#N/A	
	596	Raw meat	3,48	3,83	3,65	0,36			#N/A		#N/A	
	628	Raw pork meat	6,46	6,23	6,35	-0,23			#N/A		#N/A	
	632	Pork raw meat	3,74	4,18	3,96	0,44			#N/A		#N/A	
	639	Turkey raw meat	4,04	4,57	4,30	0,53			#N/A		#N/A	
	640	Chicken raw meat	4,00	3,94	3,97	-0,06			#N/A		#N/A	
	641	Horse raw meat	3,54	3,96	3,75	0,41			#N/A		#N/A	
	590	Sausages	3,26	2,95	3,10	-0,30			#N/A		#N/A	
	591	Sausages	2,57	2,08	2,32	-0,49			#N/A		#N/A	
	592	Sausages	2,71	2,86	2,79	0,16			#N/A		#N/A	
	633	Delicatessen	4,30	4,57	4,43	0,27			#N/A		#N/A	
	634	Delicatessen	2,74	3,00	2,87	0,26			#N/A		#N/A	
	635	Sausages	3,53	3,43	3,48	-0,10			#N/A		#N/A	
	638	Merguez	4,86	4,96	4,91	0,10			#N/A		#N/A	
	595	RTRH meat product (pork)			#N/A			6,69	#N/A			
	636	RTRH meat product (pork)	3,76	3,89	3,83	0,13			#N/A		#N/A	
	642	RTRH meat product	3,11	3,23	3,17	0,12			#N/A		#N/A	
	6684	RTRH meat product (chicken)	3,45	2,26	2,85	-1,19			#N/A		#N/A	
	6685	Cooked chicken fillet	1,78	1,65	1,72	-0,12			#N/A		#N/A	
	6686	Cooked roast chicken	2,62	1,49	2,06	-1,13			#N/A		#N/A	
	6694	RTRH meat product (shepherd's pie)	0,00		#N/A			0,00	#N/A		0,00	0,00
Average category 1							-0,02					
Standard deviation of differences category 1							0,45					
2	725	Raw milk	4,41	4,57	4,49	0,15			#N/A		#N/A	
	824	Raw milk	3,28	3,26	3,27	-0,02			#N/A		#N/A	
	842	Raw milk	5,99	6,32	6,15	0,34			#N/A		#N/A	
	880	Raw milk	4,43	4,57	4,50	0,14			#N/A		#N/A	
	6863	Raw milk	4,26	4,69	4,47	0,43			#N/A		#N/A	
	726	Cheese	3,40	3,60	3,50	0,20			#N/A		#N/A	
	727	Cheese		5,57					#N/A		#N/A	
	825	Cheese	6,11		#N/A			6,69	#N/A		6,40	0,58
	847	Cheese			#N/A			6,69	#N/A			
	848	Cheese			#N/A			6,69	#N/A			
	879	Cheese	4,15	4,40	4,27	0,25			#N/A		#N/A	
	1002	Cheese	4,46	4,57	4,52	0,11			#N/A		#N/A	
	1003	Cheese	4,57	4,89	4,73	0,32			#N/A		#N/A	
	1006	Cheese	4,32	4,70	4,51	0,38			#N/A		#N/A	
	1000	Milk powder	3,85	3,68	3,76	-0,16			#N/A		#N/A	
	1001	Milk powder	2,70				3,15		2,92	0,45	#N/A	
	7248	Skim milk powder	3,04	3,32	3,18	0,28			#N/A		#N/A	
	7249	Half skim milk powder	4,30	4,57	4,43	0,27			#N/A		#N/A	
	7250	Milk powder	4,00	4,40	4,20	0,40			#N/A		#N/A	
	8539	Milk powder	3,63	38,3	3,73	0,19			#N/A		#N/A	
8540	Milk powder	3,71	3,78	3,74	0,07			#N/A		#N/A		
Average category 2							0,21					
Standard deviation of differences category 2							0,16					

Category	N°sample	Product	Log cfu/g		Average	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				
3	627	Brussels sprouts	1,30		#N/A		1,65		1,48	0,35	#N/A	
	629	Green beans	2,72	1,93	2,33	-0,79			#N/A		#N/A	
	630	Zucchini	2,23	1,00	1,62	-1,23			#N/A		#N/A	
	631	Fried vegetables	0,00		#N/A			1,00	#N/A		0,50	1,00
	947	Sliced vegetables	3,30	2,99	3,14	-0,31			#N/A		#N/A	
	1014	Diced tomatoes	1,00		#N/A			1,51	#N/A		1,25	0,51
	1085	Mix vegetables	1,00		#N/A			0,00	#N/A		0,50	-1,00
	6864	Frozen sliced leeks	0,00		#N/A			0,00	#N/A		0,00	0,00
	6865	Frozen carrots	0,00		#N/A			0,00	#N/A		0,00	0,00
	6866	Frozen fried vegetables	1,70	1,32	1,51	-0,38			#N/A		#N/A	
	7077	Frozen cauliflower	3,81	4,08	3,95	0,27			#N/A		#N/A	
	7083	Frozen spring vegetables	0,00		#N/A				#N/A		#N/A	
	7226	Frozen peas	3,15	3,83	3,49	0,68			#N/A		#N/A	
	844	Sliced carrots	1,40*		#N/A	1,65			1,53	0,26	#N/A	
	877	Unseasoned sliced carrots			#N/A			6,69	#N/A			
	878	Red cabbage	5,80	5,69	5,74	-0,11			#N/A		#N/A	
	6688	Chive	3,32	2,56	2,94	-0,77			#N/A		#N/A	
	7084	Grated carrots	5,26	4,23	4,74	-1,02			#N/A		#N/A	
	7085	Unseasoned RTE vegetables	5,11	5,15	5,13	0,03			#N/A		#N/A	
	7086	Unseasoned RTE vegetables	4,11	4,23	4,17	0,12			#N/A		#N/A	
	561	Spinach with bechamel			#N/A			6,69	#N/A			
	593	RTE salad	2,61	2,40	2,51	-0,21			#N/A		#N/A	
	845	RTE salad (celery)	4,53	4,63	4,58	0,10			#N/A		#N/A	
	1084	RTE salad	1,00		#N/A			0,00	#N/A		0,50	-1,00
	6687	Creamed spinach	2,34	2,34	2,34	0,00			#N/A		#N/A	
	6689	Mashed potatoes	2,85	3,28	3,06	0,43			#N/A		#N/A	
	6871	RTE salad (macedoine)	0,00		#N/A			0,00	#N/A		0,00	0,00
7078	Marinated artichoke heart	0,00		#N/A			0,00	#N/A		0,00	0,00	
7224	RTE salad (cucumber)	0,00		#N/A			0,00	#N/A		0,00	0,00	
7225	RTRH cauliflower gratin	3,15	3,53	3,34	0,39			#N/A		#N/A		
Average category 3												
Standard deviation of differences category 3												
4	945	Seafood cocktail	1,88	2,32	2,10	0,45			#N/A		#N/A	
	946	Fish	0,00		#N/A			0,00	#N/A		0,00	0,00
	1083	Tuna	7,18		#N/A			6,69	#N/A		6,94	-0,49
	6691	Frozen wild salmon	3,04	2,58	2,81	-0,46			#N/A		#N/A	
	6696	Raw fish	3,51	2,85	3,18	-0,66			#N/A		#N/A	
	6697	Raw fish fillet	4,38	4,08	4,23	-0,30			#N/A		#N/A	
	7087	Raw fish fillet	2,90	3,15	3,02	0,24			#N/A		#N/A	
	846	Smoked salmon	1,48		#N/A	1,43	1,43		1,45	-0,05	#N/A	
	944	Smoked salmon	3,93	3,96	3,94	0,03			#N/A		#N/A	
	6867	Smoked fish fillets	0,00		#N/A			0,00	#N/A		0,00	0,00
	6868	Smoked fish	1,96	1,32	1,64	-0,64			#N/A		#N/A	
	6869	Smoked salmon	0,00		#N/A			0,00	#N/A		0,00	0,00
	7079	Smoked fish fillets	2,45	2,15	2,30	-0,30			#N/A		#N/A	
	7080	Smoked fish fillets	3,15	2,80	2,97	-0,35			#N/A		#N/A	
	7081	Smoked salmon	2,41	2,80	2,61	0,38			#N/A		#N/A	
	637	RTRH seafood product (prawns)	4,08	4,15	4,11	0,07			#N/A		#N/A	
	843	Salmon terrine	2,34	2,08	2,21	-0,26			#N/A		#N/A	
	886	Fish terrine	2,26	2,64	2,45	0,39			#N/A		#N/A	
	6690	Cooked mussels meat	1,85		#N/A			0,00	#N/A		0,92	-1,85
	6692	Fried fish	2,53	2,11	2,32	-0,42			#N/A		#N/A	
6693	Breaded fish	2,87	2,91	2,89	0,04			#N/A		#N/A		
6695	RTE salad (smoked salmon)	0,00		#N/A			0,00	#N/A		0,00	0,00	
Average category 4												
Standard deviation of differences category 4												

Category	N°sample	Product	Log cfu/g		Average	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				
5	728	Liquid egg			#N/A			6,69	#N/A			
	827	Liquid egg	2,43	2,20	2,32	-0,23			#N/A		#N/A	
	890	White liquid egg	1,60		#N/A			0,00	#N/A		0,80	-1,60
	948	Liquid egg	8,18		#N/A			6,69	#N/A		7,44	-1,49
	950	Yellow liquid egg	8,18		#N/A			6,69	#N/A		7,44	-1,49
	1007	Liquid egg	5,45	5,67	5,56	0,22			#N/A		#N/A	
	1008	Yellow liquid egg	5,89	5,91	5,90	0,02			#N/A		#N/A	
	1013	White liquid egg	5,11	5,32	5,22	0,21			#N/A		#N/A	
	6698	Liquid egg product	3,08	4,04	3,56	0,96			#N/A		#N/A	
	949	Tortilla	8,18		#N/A			6,69	#N/A		7,44	-1,49
	1009	Mushroom tortilla	5,77	5,83	5,80	0,06			#N/A		#N/A	
	1012	Scrambled eggs	5,33		#N/A			6,69	#N/A		6,01	1,36
	1086	Tortilla	4,26	4,69	4,47	0,43			#N/A		#N/A	
	1087	Tortilla	4,52	4,48	4,50	-0,04			#N/A		#N/A	
	1088	Scrambled eggs	4,30	4,57	4,43	0,27			#N/A		#N/A	
	6870	Tortilla	0,00		#N/A			0,00	#N/A		0,00	0,00
	7082	Mayonnaise	2,61	1,51	2,06	-1,11			#N/A		#N/A	
	587	Pastry	1,98	1,76	1,87	-0,22			#N/A		#N/A	
	588	Chocolate meringue	2,76	2,28	2,52	-0,48			#N/A		#N/A	
	826	Pastry	2,30	2,18	2,24	-0,12			#N/A		#N/A	
	889	Almond cream	1,54		#N/A		1,52		1,53	-0,02	#N/A	
	6699	Cream pastry	3,15	3,36	3,25	0,22			#N/A		#N/A	
	6700	Pastry	6,48		#N/A			7,69	#N/A		7,08	1,21
6872	Pastry	6,52	6,15	6,33	-0,37			#N/A		#N/A		
Average category 5												
Standard deviation of differences category 5												
6	887	Bird seeds	3,83	3,83	3,83	0,00			#N/A		#N/A	
	888	Bird seeds	0,00		#N/A			0,00	#N/A		0,00	0,00
	943	Low moisture kitten food	3,93	3,78	3,85	-0,15			#N/A		#N/A	
	6701	Low moisture feed meal	2,69	3,00	2,85	0,31			#N/A		#N/A	
	7251	Low moisture dog food	3,43	3,34	3,39	-0,09			#N/A		#N/A	
	7252	Low moisture cat food	4,54	4,40	4,47	-0,15			#N/A		#N/A	
	873	Dog sausages	3,43	3,49	3,46	0,06			#N/A		#N/A	
	874	High moisture dog food	5,23	5,40	5,31	0,17			#N/A		#N/A	
	939	Dog sausages	3,65	3,70	3,68	0,05			#N/A		#N/A	
	940	High moisture pet food	3,36	3,08	3,22	-0,28			#N/A		#N/A	
	941	High moisture dog food	4,93	5,18	5,06	0,24			#N/A		#N/A	
	942	High moisture cat food	5,30	5,48	5,39	0,18			#N/A		#N/A	
	875	Raw pet food meat	3,61	3,74	3,68	0,13			#N/A		#N/A	
	876	Raw minced pet food meat	5,53	5,48	5,50	-0,05			#N/A		#N/A	
	7088	Raw pet food meat	3,56	3,49	3,52	-0,06			#N/A		#N/A	
	7089	Raw pet food meat	3,68	3,89	3,79	0,21			#N/A		#N/A	
7090	Raw pet food meat	4,43	4,66	4,55	0,23			#N/A		#N/A		
Average category 6												
Standard deviation of differences category 6												
Average all categories						Dall						
Standard deviation of differences all categories						SDAll						

β=95%	n all	100						
	T(0,05;70)=	1,98						
		0,80	Upper limit	Lower limit	Linear			
	Average (minimal value)	0,00	0,79	-0,81	-0,01			
	Average (maximal value)	10,00	0,79	-0,81	-0,01			
	Category	n	T(0,05;70)=	SD	ISO formula	Bias	Lower limit (95%)	Upper limit (95%)
	1	22	2,08	0,45	0,95	-0,02	-0,97	0,94
	2	16	2,13	0,16	0,35	0,21	-0,14	0,56
	3	16	2,13	0,55	1,20	-0,18	-1,38	1,02
	4	15	2,14	0,37	0,83	-0,12	-0,95	0,71
	5	15	2,14	0,47	1,03	-0,01	-1,05	1,02
	6	16	2,13	0,17	0,37	0,05	-0,32	0,42
	All categories	100	1,98	0,40	0,80	-0,01	-0,81	0,79

Appendix 6 - Accuracy profile study: raw data

Matrix	Strain	Level	Sample N°	Reference method: ISO 21528-2♦				Alternative method: TEMPO EB 22h at 35°C	
				Dilution	cfu/plate	cfu/g	log cfu/g	cfu/g	log cfu/g
Ground beef-Batch 1 Aerobic mesophilic flora : 8,7.10 ⁴ CFU/g	<i>Enterobacter cloacae</i> 128	1	6621	10	38	360	2,56	230	2,36
				100	1				
			6622	10	34	350	2,54	480	2,68
				100	4				
			6623	10	41	380	2,58	300	2,48
				100	1				
		6624	10	30	300	2,48	460	2,66	
			100	3					
		6625	10	34	310	2,49	230	2,36	
			100	0					
		2	6626	100	52	4800	3,68	5000	3,70
				1000	1				
			6627	100	58	5900	3,77	5300	3,72
				1000	7				
			6628	100	36	3400	3,53	11000	4,04
				1000	1				
		6629	100	53	4800	3,68	4000	3,60	
			1000	0					
		6630	100	51	5100	3,71	7800	3,89	
			1000	5					
		3	6631	1000	99	100000	5,00	210000	5,32
				10000	12				
			6632	1000	93	90000	4,95	150000	5,18
				10000	6				
			6633	1000	103	100000	5,00	170000	5,23
				10000	10				
		6634	1000	112	110000	5,04	120000	5,08	
			10000	8					
		6635	1000	71	75000	4,88	210000	5,32	
			10000	12					
Ground beef-Batch 2 Aerobic mesophilic flora : 1,6.10 ⁴ CFU/g	<i>Enterobacter cloacae</i> 128	1	6636	10	28	270	2,43	260	2,41
				100	2				
			6637	10	32	310	2,49	260	2,41
				100	2				
			6638	10	33	300	2,48	280	2,45
				100	0				
		6639	10	42	430	2,63	280	2,45	
			100	5					
		6640	10	35	380	2,58	440	2,64	
			100	7					
		2	6641	100	41	4400	3,64	3700	3,57
				1000	7				
			6642	100	52	5100	3,71	5500	3,74
				1000	4				
			6643	100	43	4100	3,61	4000	3,60
				1000	2				
		6644	100	36	3700	3,57	5200	3,72	
			1000	5					
		6645	100	39	3800	3,58	3400	3,53	
			1000	3					
		3	6646	1000	59	57000	4,76	120000	5,08
				10000	4				
			6647	1000	74	73000	4,86	170000	5,23
				10000	6				
			6648	1000	84	87000	4,94	150000	5,18
				10000	12				
		6649	1000	97	95000	4,98	91000	4,96	
			10000	8					
		6650	1000	71	75000	4,88	150000	5,18	
			10000	12					

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	Sample N°	Reference method: ISO 21528-2♦				Alternative method: TEMPO EB 22h at 35°C	
				Dilution	cfu/plate	cfu/g	log cfu/g	cfu/g	log cfu/g
Milk-Batch 1 Aerobic mesophilic flora : 1,2.10 ³ CFU/g	Escherichia coli 94	1	6997	10	36	370	2,57	360	2,56
				100	5				
			6998	10	40	400	2,60	400	2,60
				100	4				
			6999	10	40	380	2,58	250	2,40
				100	2				
		7000	10	41	390	2,59	460	2,66	
			100	2					
		7001	10	51	540	2,73	510	2,71	
			100	8					
		2	7002	100	38	3800	3,58	6800	3,83
				1000	4				
			7003	100	51	4800	3,68	9100	3,96
				1000	2				
			7004	100	56	5400	3,73	6800	3,83
				1000	3				
		7005	100	41	3900	3,59	6000	3,78	
			1000	2					
		7006	100	53	5600	3,75	6800	3,83	
			1000	9					
		3	7007	1000	70	66000	4,82	120000	5,08
10000	3								
7008	1000		61	66000	4,82	210000	5,32		
	10000		12						
7009	1000		57	55000	4,74	170000	5,23		
	10000		4						
7010	1000	103	100000	5,00	150000	5,18			
	10000	10							
7011	1000	66	72000	4,86	150000	5,18			
	10000	13							
Milk-Batch 2 Aerobic mesophilic flora : 2,1.10 ³ CFU/g	Escherichia coli 94	1	7012	10	41	390	2,59	300	2,48
				100	2				
			7013	10	33	340	2,53	440	2,64
				100	4				
			7014	10	43	440	2,64	480	2,68
				100	5				
		7015	10	36	360	2,56	280	2,45	
			100	3					
		7016	10	39	360	2,56	280	2,45	
			100	1					
		2	7017	100	42	4300	3,63	6000	3,78
				1000	5				
			7018	100	44	4500	3,65	9100	3,96
				1000	6				
			7019	100	46	4600	3,66	6000	3,78
				1000	5				
		7020	100	41	4000	3,60	6800	3,83	
			1000	3					
		7021	100	47	4600	3,66	6000	3,78	
			1000	4					
		3	7022	1000	67	65000	4,81	250000	5,40
10000	5								
7023	1000		81	84000	4,92	250000	5,40		
	10000		11						
7024	1000		64	64000	4,81	250000	5,40		
	10000		6						
7025	1000	73	75000	4,88	150000	5,18			
	10000	9							
7026	1000	76	74000	4,87	150000	5,18			
	10000	5							

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	Sample N°	Reference method: ISO 21528-2♦				Alternative method: TEMPO EB 22h at 35°C	
				Dilution	cfu/plate	cfu/g	log cfu/g	cfu/g	log cfu/g
Green beans-Batch 1 Aerobic mesophilic flora : 1,2.10 ³ CFU/g	<i>Escherichia hermannii</i> Ad457	1	7037	10	30	280	2,45	210	2,32
				100	1				
			7038	10	34	330	2,52	220	2,34
				100	2				
			7039	10	21	200	2,30	170	2,23
				100	1				
		7040	10	28	320	2,51	130	2,11	
			100	7					
		7041	10	39	360	2,56	190	2,28	
			100	1					
		2	7042	100	25	2500	3,40	3700	3,57
				1000	2				
			7043	100	34	3500	3,54	5600	3,75
				1000	5				
			7044	100	42	4100	3,61	2200	3,34
				1000	3				
		7045	100	37	3600	3,56	4000	3,60	
			1000	3					
		3	7046	100	41	4000	3,60	1900	3,28
				1000	3				
			7047	1000	45	44000	4,64	210000	5,32
10000	3								
7048	1000		64	69000	4,84	170000	5,23		
	10000		12						
7049	1000	53	52000	4,72	120000	5,08			
	10000	4							
7050	1000	74	75000	4,88	250000	5,40			
	10000	9							
7051	1000	70	72000	4,86	120000	5,08			
	10000	9							
Green beans-Batch 2 Aerobic mesophilic flora : 2,9.10 ² CFU/g	<i>Escherichia hermannii</i> Ad457	1	7052	10	33	340	2,53	230	2,36
				100	4				
			7053	10	37	350	2,54	210	2,32
				100	1				
			7054	10	30	300	2,48	120	2,08
				100	3				
		7055	10	20	210	2,32	120	2,08	
			100	3					
		7056	10	31	310	2,49	190	2,28	
			100	3					
		2	7057	100	35	3400	3,53	1400	3,15
				1000	2				
			7058	100	35	3500	3,54	2300	3,36
				1000	3				
			7059	100	37	3600	3,56	3900	3,59
				1000	3				
		7060	100	31	3100	3,49	1600	3,20	
			1000	3					
3	7061	100	33	3600	3,56	2400	3,38		
		1000	7						
	7062	1000	55	56000	4,75	120000	5,08		
		10000	7						
	7063	1000	57	58000	4,76	150000	5,18		
		10000	7						
7064	1000	59	57000	4,76	68000	4,83			
	10000	4							
7065	1000	49	51000	4,71	91000	4,96			
	10000	7							
7066	1000	42	42000	4,62	120000	5,08			
	10000	4							

♦ Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	Sample N°	Reference method: ISO 21528-2*				Alternative method: TEMPO EB 22h at 35°C	
				Dilution	cfu/plate	cfu/g	log cfu/g	cfu/g	log cfu/g
Fish terrine-Batch 1 Aerobic mesophilic flora: 20 CFU/g	<i>Citrobacter freundii</i> 24	1	6812	10	32	310	2,49	140	2,15
				100	2				
			6813	10	26	250	2,40	170	2,23
				100	1				
			6814	10	32	310	2,49	280	2,45
				100	2				
		6815	10	33	310	2,49	330	2,52	
			100	1					
		6816	10	32	310	2,49	200	2,30	
			100	2					
		2	6817	100	33	3400	3,53	3700	3,57
				1000	4				
			6818	100	43	4100	3,61	6700	3,83
				1000	2				
			6819	100	51	5400	3,73	4400	3,64
				1000	8				
		6820	100	44	4200	3,62	4100	3,61	
			1000	2					
		6821	100	51	5000	3,70	4000	3,60	
			1000	4					
		3	6822	1000	96	94000	4,97	150000	5,18
				10000	7				
			6823	1000	68	69000	4,84	150000	5,18
				10000	8				
6824	1000		75	74000	4,87	170000	5,23		
	10000		6						
6825	1000	73	72000	4,86	110000	5,04			
	10000	6							
6826	1000	56	59000	4,77	300000	5,48			
	10000	9							
Fish terrine-Batch 2 Aerobic mesophilic flora: 20 CFU/g	<i>Citrobacter freundii</i> 24	1	6827	10	32	290	2,46	170	2,23
				100	0				
			6828	10	41	420	2,62	280	2,45
				100	5				
			6829	10	19	220	2,34	300	2,48
				100	5				
		6830	10	33	320	2,51	390	2,59	
			100	2					
		6831	10	31	280	2,45	230	2,36	
			100	0					
		2	6832	100	42	4200	3,62	6800	3,83
				1000	4				
			6833	100	34	3600	3,56	3400	3,53
				1000	6				
			6834	100	36	3500	3,54	4500	3,65
				1000	3				
		6835	100	46	4800	3,68	4000	3,60	
			1000	7					
		6836	100	51	4900	3,69	3700	3,57	
			1000	3					
		3	6837	1000	74	75000	4,88	91000	4,96
				10000	8				
			6838	1000	62	61000	4,79	170000	5,23
				10000	5				
6839	1000		67	70000	4,85	150000	5,18		
	10000		10						
6840	1000	80	80000	4,90	170000	5,23			
	10000	8							
6841	1000	84	81000	4,91	210000	5,32			
	10000	5							

* Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	Sample N°	Reference method: ISO 21528-2*				Alternative method: TEMPO EB 22h at 35°C	
				Dilution	cfu/plate	cfu/g	log cfu/g	cfu/g	log cfu/g
Liquid egg-Batch 1 Aerobic mesophilic flora : 30 CFU/g	<i>Klebsiella pneumoniae</i> 92	1	6772	10	25	270	2,43	200	2,30
				100	5				
			6773	10	18	190	2,28	160	2,20
				100	3				
			6774	10	16	160	2,20	200	2,30
				100	1				
		6775	10	26	250	2,40	230	2,36	
			100	1					
		6776	10	25	250	2,40	220	2,34	
			100	2					
		2	6777	100	28	2600	3,41	3400	3,53
				1000	1				
			6778	100	35	3600	3,56	2400	3,38
				1000	5				
			6779	100	25	2500	3,40	2900	3,46
				1000	2				
		6780	100	31	3300	3,52	4400	3,64	
			1000	5					
		3	6781	100	28	2500	3,40	4100	3,61
				1000	0				
			6782	1000	51	51000	4,71	53000	4,72
				10000	5				
			6783	1000	51	54000	4,73	150000	5,18
				10000	8				
6784	1000	48	49000	4,69	150000	5,18			
	10000	6							
6785	1000	53	54000	4,73	120000	5,08			
	10000	6							
6786	1000	47	46000	4,66	91000	4,96			
	10000	4							
Liquid egg-Batch 2 Aerobic mesophilic flora : 200 CFU/g	<i>Klebsiella pneumoniae</i> 92	1	6787	10	15	170	2,23	280	2,45
				100	4				
			6788	10	26	270	2,43	160	2,20
				100	4				
			6789	10	23	240	2,38	190	2,28
				100	3				
		6790	10	22	200	2,30	390	2,59	
			100	0					
		6791	10	26	260	2,41	210	2,32	
			100	3					
		2	6792	100	21	2400	3,38	4500	3,65
				1000	5				
			6793	100	33	3400	3,53	5000	3,70
				1000	4				
			6794	100	40	4300	3,63	3700	3,57
				1000	7				
		6795	100	35	3500	3,54	2500	3,40	
			1000	3					
		6796	100	32	3200	3,51	7800	3,89	
			1000	3					
		3	6797	1000	58	57000	4,76	120000	5,08
				10000	5				
			6798	1000	57	58000	4,76	120000	5,08
				10000	7				
6799	1000		53	58000	4,76	150000	5,18		
	10000		11						
6800	1000	53	54000	4,73	55000	4,74			
	10000	6							
6801	1000	51	50000	4,70	120000	5,08			
	10000	4							

* Analyses performed according to the COFRAC accreditation

Matrix	Strain	Level	Sample N°	Reference method: ISO 21528-2♦				Alternative method: TEMPO EB 22h at 35°C	
				Dilution	cfu/plate	cfu/g	log cfu/g	cfu/g	log cfu/g
Dog pâté-Batch 1 Aerobic mesophilic flora : <10 CFU/g	Hafnia alvei 124	1	7184	10	48	460	2,66	360	2,56
				100	2				
			7185	10	53	520	2,72	730	2,86
				100	4				
			7186	10	41	430	2,63	560	2,75
				100	6				
		7187	10	43	460	2,66	310	2,49	
			100	8					
		7188	10	46	460	2,66	440	2,64	
			100	5					
		2	7189	100	45	4700	3,67	12000	4,08
				1000	7				
			7190	100	47	4800	3,68	15000	4,18
				1000	6				
			7191	100	50	5500	3,74	6800	3,83
				1000	10				
		7192	100	67	6400	3,81	7800	3,89	
			1000	3					
		7193	100	80	8200	3,91	12000	4,08	
			1000	10					
		3	7194	1000	102	100000	5,00	370000	5,57
10000	10								
7195	1000		109	100000	5,00	170000	5,23		
	10000		5						
7196	1000		105	100000	5,00	300000	5,48		
	10000		10						
7197	1000	90	88000	4,94	190000	5,28			
	10000	7							
7198	1000	112	110000	5,04	250000	5,40			
	10000	13							
Dog pâté-Batch 2 Aerobic mesophilic flora : <10 CFU/g	Hafnia alvei 124	1	7199	10	56	580	2,76	440	2,64
				100	8				
			7200	10	52	510	2,71	310	2,49
				100	4				
			7201	10	41	420	2,62	360	2,56
				100	5				
		7202	10	49	580	2,76	390	2,59	
			100	15					
		7203	10	54	530	2,72	220	2,34	
			100	4					
		2	7204	100	75	8000	3,90	9100	3,96
				1000	13				
			7205	100	54	5300	3,72	9100	3,96
				1000	4				
			7206	100	55	5600	3,75	9100	3,96
				1000	7				
		7207	100	55	5200	3,72	7400	3,87	
			1000	2					
		7208	100	42	4200	3,62	5500	3,74	
			1000	4					
		3	7209	1000	85	88000	4,94	370000	5,57
10000	12								
7210	1000		90	93000	4,97	210000	5,32		
	10000		12						
7211	1000		93	93000	4,97	210000	5,32		
	10000		9						
7212	1000	80	85000	4,93	210000	5,32			
	10000	13							
7213	1000	71	69000	4,84	250000	5,40			
	10000	5							

♦ Analyses performed according to the COFRAC accreditation

Appendix 7 - Accuracy profile study: summarized results

(Food) Category 1			Meat and meat products									
(Food) Type 1			Raw meat									
Sample Name	(Food) item	Level	Reference method result					Alternative method result				
			rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
6621-6625	Ground beef	1	360	350	380	300	310	230	480	300	460	230
6636-6640	Ground beef	1	270	310	300	430	380	260	260	280	280	440
6626-6630	Ground beef	2	4800	5900	3400	4800	5100	5000	5300	11000	4000	7800
6641-6645	Ground beef	2	4400	5100	4100	3700	3800	3700	5500	4000	5200	3400
6631-6635	Ground beef	3	100000	90000	100000	110000	75000	93000	160000	110000	180000	110000
6646-6650	Ground beef	3	57000	73000	87000	95000	75000	340000	95000	150000	110000	140000

(Food) Category 2			Dairy products									
(Food) Type 2			Raw milk									
Sample Name	(Food) item	Level	Reference method result					Alternative method result				
			rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
6997-7001	Milk	1	370	400	380	390	540	360	400	250	460	510
7012-7016	Milk	1	390	340	440	360	360	300	440	480	280	280
7002-7006	Milk	2	3800	4800	5400	3900	5600	6800	9100	6800	6000	6800
7017-7021	Milk	2	4300	4500	4600	4000	4600	6000	9100	6000	6800	6000
7007-7011	Milk	3	66000	66000	55000	100000	72000	120000	160000	95000	110000	110000
7022-7026	Milk	3	65000	84000	64000	75000	74000	170000	120000	240000	110000	170000

(Food) Category 3			Vegetables									
(Food) Type 3			RTC									
Sample Name	(Food) item	Level	Reference method result					Alternative method result				
			rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
7037-7041	Green beans	1	280	330	200	320	360	210	220	170	130	190
7052-7056	Green beans	1	340	350	300	210	310	230	210	120	120	190
7042-7046	Green beans	2	2500	3500	4100	3600	4000	3700	5600	2200	4000	1900
7057-7061	Green beans	2	3400	3500	3600	3100	3600	1400	2300	3900	1600	2400
7047-7051	Green beans	3	44000	69000	52000	75000	72000	120000	120000	57000	140000	93000
7062-7066	Green beans	3	56000	58000	57000	51000	42000	140000	120000	83000	110000	120000

(Food) Category 4			Fish and seafood									
(Food) Type 4			RTE, RTRH									
Sample Name	(Food) item	Level	Reference method result					Alternative method result				
			rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
6812-6816	Fish terrine	1	310	250	310	310	310	140	170	280	330	200
6827-6831	Fish terrine	1	290	420	220	320	280	170	280	300	390	230
6817-6821	Fish terrine	2	3400	4100	5400	4200	5000	3700	6700	4400	4100	4000
6832-6836	Fish terrine	2	4200	3600	3500	4800	4900	6800	3400	4500	4000	3700
6822-6826	Fish terrine	3	94000	69000	74000	72000	59000	110000	95000	95000	95000	200000
6837-3841	Fish terrine	3	75000	61000	70000	80000	81000	220000	170000	130000	85000	64000

(Food) Category 5			Egg products									
(Food) Type 5			Liquid egg									
Sample Name	(Food) item	Level	Reference method result					Alternative method result				
			rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
6772-6776	Liquid egg	1	270	190	160	250	250	200	160	200	230	220
6787-6791	Liquid egg	1	170	270	240	200	260	280	160	190	390	210
6777-6781	Liquid egg	2	2600	3600	2500	3300	2500	3400	2400	2900	4400	4100
6792-6796	Liquid egg	2	2400	3400	4300	3500	3200	4500	5000	3700	2500	7800
6782-6786	Liquid egg	3	51000	54000	49000	54000	46000	93000	120000	95000	73000	58000
6797-6801	Liquid egg	3	57000	58000	58000	54000	50000	68000	64000	58000	40000	100000

(Food) Category 6			Pet foods									
(Food) Type 6			Dog pâté									
Sample Name	(Food) item	Level	Reference method result					Alternative method result				
			rep 1	rep 2	rep 3	rep 4	rep 5	rep 1	rep 2	rep 3	rep 4	rep 5
7184-7188	Dog pâté	1	460	520	430	460	460	360	730	560	310	440
7199-7203	Dog pâté	1	580	510	420	580	530	440	310	360	390	220
7189-7193	Dog pâté	2	4700	4800	5500	6400	8200	12000	15000	6800	7800	12000
7204-7208	Dog pâté	2	8000	5300	5600	5200	4200	9100	9100	9100	7400	5500
7194-7198	Dog pâté	3	100000	100000	100000	88000	110000	310000	340000	220000	190000	220000
7209-7213	Dog pâté	3	88000	93000	93000	85000	69000	200000	340000	250000	450000	190000

Appendix 8 – Quantification limits (LOQ): raw data

Sample N°	Matrix	Alternative method: TEMPO EB					
		Observed value	Value for calculation	Yi	\bar{y}	So	LOQ
6651	Ground beef	<10	10	1	1,08	0	0
6652		10	10	1			
6653		<10	10	1			
6654		<10	10	1			
6655		33	33	1,52			
6656		10	10	1			
6657		<10	10	1			
6658		10	10	1			
6659		10	10	1			
6660		21	21	1,32			
7027		Milk	<10	10			
7028	<10		10	1			
7029	<10		10	1			
7030	<10		10	1			
7031	<10		10	1			
7032	<10		10	1			
7033	<10		10	1			
7034	<10		10	1			
7035	<10		10	1			
7036	<10		10	1			
7067	Green beans	<10	10	1	1	0	0
7068		<10	10	1			
7069		<10	10	1			
7070		<10	10	1			
7071		<10	10	1			
7072		<10	10	1			
7073		<10	10	1			
7074		<10	10	1			
7075		<10	10	1			
7076		<10	10	1			
6842	Fish terrine	<10	10	1	1	0	0
6843		<10	10	1			
6844		<10	10	1			
6845		<10	10	1			
6846		<10	10	1			
6847		<10	10	1			
6848		<10	10	1			
6849		<10	10	1			
6850		<10	10	1			
6851		<10	10	1			
6802	Liquid egg	<10	10	1	1	0	0
6803		<10	10	1			
6804		<10	10	1			
6805		<10	10	1			
6806		<10	10	1			
6807		<10	10	1			
6808		<10	10	1			
6809		<10	10	1			
6810		<10	10	1			
6811		<10	10	1			
7214	Dog pâté	<10	10	1	1	0	0
7215		<10	10	1			
7216		<10	10	1			
7217		<10	10	1			
7218		<10	10	1			
7219		<10	10	1			
7220		<10	10	1			
7221		<10	10	1			
7222		<10	10	1			
7223		<10	10	1			

Appendix 9 – Inclusivity / Exclusivity: raw data

INCLUSIVITY						
Date of analysis	Strain	Origin	Dilution	PCA	VRBG	TEMPO EB
				CFU/plate	CFU/plate	
2006	1	<i>Buttiaux agrestis</i> 115	Turnip	-6		19/22
				-7	17/31	2/1
2006	2	<i>Citrobacter diversus</i> 38	/	-6		60/37
				-7	50/60	6/13
2006	3	<i>Citrobacter freundii</i> 53	Bean	-6		21/12
				-7	10/11	8/8
2006	4	<i>Citrobacter freundii</i> CIP 5732	/	-6		41/37
				-7	40/34	12/5
2006	5	<i>Edwardsiella tarda</i> CIP 7861	/	-6		21/34
				-7	25/20	15/19
2006	6	<i>Enterobacter agglomerans</i> 11	Cheese	-6		24/16
				-7	23/16	13/8
2006	7	<i>Enterobacter amnigenus</i> 52	Bean	-6		2/3
				-7	8/4	4/4
2006	8	<i>Enterobacter cloacae</i> Adria 10	Raw milk	-6		17/14
				-7	6/4	13/10
2006	9	<i>Enterobacter sakazakii</i> D7	Poultry	-6		91/110
				-7	64/43	58/46
2006	10	<i>Escherichia coli</i> CIP54117	/	-6		12/37
				-7	77/98	9/8
2006	11	<i>Escherichia hermanii</i> 395	Raw material meat product	-6		6/9
				-7	>300/>300	24/22
2006	12	<i>Escherichia vulneris</i> 127	Raw milk	-6		37/31
				-7	>300/>300	14/10
2006	13	<i>Ewingella americana</i> 71	Frozen vegetable	-6		47/37
				-7	107/137	7/3
2006	14	<i>Hafnia alvei</i> Adria 168	Mechanically deboned meat	-6		16/19
				-7	70/72	11/14
2006	15	<i>Klebsiella oxytoca</i> CIP 7932	/	-6		18/16
				-7	83/88	14/14
2006	16	<i>Klebsiella pneumoniae</i> CIP 8291	/	-6		20/14
				-7	100/90	6/6
2006	17	<i>Kluyvera ascorbota</i> CIP 8295	/	-6		34/15
				-7	>300/>300	36/45
2006	18	<i>Morganella morganii</i> CIP A236	/	-6		78/41
				-7	124/120	40/35
2006	19	<i>Proteus mirabilis</i> Adria 54	Mechanically deboned meat	-6		53/34
				-7	92/88	9/6
2006	20	<i>Proteus vulgaris</i> Adria 43	Pork	-6		11/8
				-7	83/56	6/6
2006	21	<i>Providencia rettgeri</i> Adria 112	Egg white	-6		39/41
				-7	98/81	36/31
2006	22	<i>Providencia stuartii</i> 46	Poult leg	-6		34/53
				-7	92/75	15/37
2006	23	<i>Rhanella aquatilis</i> 69	Shell	-6		<1/<1
				-7	3/3	23 µcol<0,5mm/ 18 µcol<0,5mm
2006	24	<i>Salmonella enteritidis</i> CIP 8297	/	-6		78/120
				-7	>300/>300	65/105
2006	25	<i>Salmonella typhimurium</i> CIP 5858	/	-6		60/91
				-7	103/103	57/26
2006	26	<i>Serratia liquefaciens</i> Adria 5	Egg products	-6		210/150
				-7	>300/>300	86/86

INCLUSIVITY						
Date of analysis	Strain	Origin	Dilution	PCA	VRBG	TEMPO EB
				CFU/plate	CFU/plate	
2006	27	<i>Shigella flexneri</i> CIP 8248	/	-6		47/40
				-7	140/138	31/28
2006	28	<i>Shigella sonnei</i> CIP 8249	/	-6		120/40
				-7	100/123	32/27
2006	29	<i>Yersinia enterocolitica</i> CIP 8027	/	-6		55/110
				-7	111/113	6/8
2006	30	<i>Pectobacterium(Erwinia) carotovora</i> CIP 8283	Vegetables	-6		10/30
				-7	40/30	20/10
2006	31	<i>Citrobacter diversus</i> CIP 8294	/	-6		16/6
				-7	15/24	<1/<1
2018	32	<i>Citrobacter braakii</i> Ad833	Beef trim	-6	>300	>150
				-7	53	32
2018	33	<i>Citrobacter youngae</i> Ad1372	Water	-6	>300	>150
				-7	58	57
2018	34	<i>Cronobacter sakazakii</i> Ad2412	Milk powder	-6	>300	>150
				-7	57	54
2018	35	<i>Cronobacter malonaticus</i> DSM18702	Milk powder	-6	163	61
				-7	18	4
2018	36	<i>Enterobacter aerogenes</i> Ad2569	Cheese	-6	183	>150
				-7	22	18
2018	37	<i>Enterobacter hormaechei</i> Ad990	Butter	-6	>300	>150
				-7	71	44
2018	38	<i>Escherichia coli</i> Ad1915	Poultry meat	-6	>300	>150
				-7	75	87
2018	39	<i>Escherichia fergusonii</i> Ad1381	Tap water	-6	>300	>150
				-7	55	27
2018	40	<i>Escherichia vulneris</i> 134	Pork liver	-6	51	27
				-7	8	0
2018	41	<i>Hafnia alvei</i> Adria 130	Cheese	-6	>300	>150
				-7	54	52
2018	42	<i>Kluyvera intermedia</i> 60	Vegetables	-6	71	69
				-7	10	8
2018	43	<i>Lelliottia amnigena</i> 126	Ground beef	-6	>300	>150
				-7	66	60
2018	44	<i>Pantoea agglomerans</i> A00L065	Cheese	-6	>300	>150
				-7	41	38
2018	45	<i>Proteus vulgaris</i> Adria 56	Food product	-6	160	>150
				-7	11	15
2018	46	<i>Providencia stuartii</i> Ad1575	River water	-6	>300	>150
				-7	53	48
2018	47	<i>Salmonella</i> Anatum Ad2727	Seafood	-6	>300	>150
				-7	73	59
2018	48	<i>Serratia fonticola</i> Ad1696	Salmon	-4	64	>150
				-5	6	39
				-6	1	2
				-7	0	0
2018	49	<i>Serratia liquefaciens</i> Adria 26	Egg product	-6	151	36
				-7	13	4
2018	50	<i>Yersinia enterocolitica</i> Ad1028	Speck	-6	241	>150
				-7	34	38

EXCLUSIVITY									
Date of analysis		Strain	Origin	Dilution	PCA	Dilution	VRBG	Dilution	TEMPO EB
					CFU/plate		CFU/plate		
2006	1	<i>Acinetobacter</i> spp Adria 46-2	Chicken	-7	5/11	-7	<1/<1	-6	<1/<1
2006	2	<i>Aerococcus</i> <i>vividens</i> Ad 184	Liquid egg	-7	5/1	-7	<1/<1	-6	<1/<1
2006	3	<i>Aeromonas</i> <i>hydrophila</i> CIP 5750	/	-7	16/28	-7	<1/<1	-6	<1/<1
2006	4	<i>Aeromonas</i> <i>sobria</i> CIP 7433	/	-5	3/2	-4	<1/<1	-3	<1/<1
2006	5	<i>Bacillus</i> <i>circulans</i> ATCC 4513	/	-5	>300/>300	-4	<1/<1	-3	<1/<1
2006	6	<i>Enterococcus</i> <i>durans</i> Ad 181	Pasteurized liquid egg	-7	28/29	-7	<1/<1	-6	<1/<1
2006	7	<i>Enterococcus</i> <i>faecalis</i> ATCC 29212	/	-7	46/33	-7	<1/<1	-6	<1/<1
2006	8	<i>Flavobacterium</i> <i>indologenes</i> 26	Liquid egg	-7	16/15	-7	<1/<1	-6	<1/<1
2006	9	<i>Josenia</i> <i>denitrificans</i> 55134	Beef blood	-7	1/1	-7	<1/<1	-6	<1/<1
2006	10	<i>Kurthia</i> <i>zopfii</i> 7621	/	-7	32/18	-7	<1/<1	-6	<1/<1
2006	11	<i>Lactobacillus</i> <i>lactis</i> ATCC 11454	/	-7	4/2	-7	<1/<1	-6	<1/<1
2006	12	<i>Lactobacillus</i> <i>plantarum</i> CIP A159	/	-7	1/2	-7	<1/<1	-6	<1/<1
2006	13	<i>Moraxella</i> 51	Poultry	-5	>300/>300	-4	<1/<1	-3	<1/<1
2006	14	<i>Photobacterium</i> <i>phosphoreum</i>	Cod	-7	57/44	-7	<1/<1	-6	<1/<1
2006	15	<i>Pseudomonas</i> <i>aeruginosa</i> CIP A22	/	-5	>300/>300	-4	<1/<1	-3	<1/<1
2006	16	<i>Pseudomonas</i> <i>fluorescens</i> CIP 5690	/	-7	6/2	-7	<1/<1	-6	<1/<1
2006	17	<i>Pseudomonas</i> <i>putida</i> Adria 8	Liquid egg	-5	25/27	-4	<1/<1	-3	<1/<1
2006	18	<i>Staphylococcus</i> <i>aureus</i> CIP 658	/	-7	28/30	-7	<1/<1	-6	<1/<1
2006	19	<i>Staphylococcus</i> <i>epidermidis</i> Ad150	Ground beef	-7	9/5	-7	<1/<1	-6	<1/<1
2006	20	<i>Stenotrophomonas</i> <i>maltophilia</i> CIP 6077	/	-7	37/50	-7	7/20	-6	34/24
2006	21	<i>Stenotrophomonas</i> <i>maltophilia</i> 112	Vegetables	-7	30/42	-7	18/17	-6	45/34
2018	22	<i>Acinetobacter</i> <i>baumanii</i> Ad1090	Feeding stuff	-6	154	-3	NC(19)	-6	<1
				-7	15	-4	NC(6)	-4	<1
2018	23	<i>Carnobacterium</i> <i>viridans</i> ATCCBAA36	/	-6	35	-3	0	-3	<1
				-7	5	-4	0	-4	<1
2018	24	<i>Agrobacterium</i> <i>tumefaciens</i> Ad1550	Water	-6	44	-3	0	-3	<1
				-7	1	-4	0	-4	<1
2018	25	<i>Arcobacter</i> <i>butzleri</i> Ad1881	Poultry environment	-6	284	-3	0	-3	<1
				-7	25	-4	0	-4	<1
2018	26	<i>Gluconobacter</i> <i>oxydans</i> Ad997	Sweetened drink	-6	152	-3	0	-3	<1
				-7	23	-4	0	-4	<1
2018	27	<i>Plesiomonas</i> <i>shigelloïdes</i> Ad673	Fish	-6	40	-4	>150	-3	3000
				-7	3	-5	>150	-4	910
2018	28	<i>Pandora</i> <i>aea</i> sp. Ad1882	Slaughterhouse	-6	<300	-3	NC(30)	-3	<1
				-7	34	-4	NC(4)	-4	<1
2018	29	<i>Flavobacterium</i> <i>hydratis</i> Ad1323	Whole egg	-6	165	-3	0	-3	<1
				-7	14	-4	0	-4	<1
2018	30	<i>Burkholderia</i> sp. Ad2003	Slaughterhouse	-6	42	-1	0	-1	<1
				-7	4	-2	0	-2	<1

NC: non-characteristic colony