

SOLABIA SAS

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NF VALIDATION
Validation of alternative analytical methods
Application to food microbiology

Summary report

**EN ISO 16140 validation of
the RHAPSODY Agar® method for the
enumeration of Pseudomonas spp. in meat and
dairy products**

Quantitative method

This report consists of 86 pages including 15 appendices.
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Foreword

All information required to validate the analysis guarantee is made available to SOLABIA.

The results are summarised in tables and interpreted as per the NF EN ISO 16140 standard.

- ✓ **Manufacturer:** Biokar Diagnostics
Rue des Quarante Mines
BP 10245
60002 BEAUVAIS Cedex
- ✓ **Expert laboratory:** ADRIA Développement
ZA Creac'h Gwen
29196 QUIMPER Cedex
- ✓ **Method to validate:** **RHAPSODY Agar® method for the enumeration of Pseudomonas spp.**
- ✓ **Validation standard:** EN ISO 16140 (October 2003): microbiology of the food chain - Protocol for the validation of alternative methods
- ✓ **Reference methods♦:** NF EN ISO 13720 (November 2010): Meat and meat-based products. Enumeration of presumed Pseudomonas spp.

XP ISO/TS 11059 (October 2009): Milk and dairy products. Method for the enumeration of Pseudomonas spp.
- ✓ **Scope of validation:** **Meat products**
Dairy products
- ✓ **Certification body:** AFNOR Certification

♦ Test conducted under accreditation

1 INTRODUCTION

The RHAPSODY Agar® method for the enumeration of *Pseudomonas* spp. was validated in May 2015 according to the EN ISO 16140 (2003) standard:

- in meat products by comparison with the reference method NF EN ISO 13720 (Certificate no. BKR 23/09 - 05/15 A),
- in dairy products by comparison with the reference method XP ISO/TS 11059 (Certificate no. BKR 23/09 - 05/15 B).

2 PRESENTATION OF THE METHODS

2.1 Reference methods♦

The reference methods used were the following standards:

- NF EN ISO 13720 (November 2010): Meat and meat-based products. Enumeration of presumed *Pseudomonas* spp.
- XP ISO/TS 11059 (October 2009): Milk and dairy products. Method for the enumeration of *Pseudomonas* spp.

The protocols for these two methods are described in Appendices 1 and 2.

2.2 Alternative method

The RHAPSODY Agar® method is based on the use of a chromogenic agar. Counts are obtained after 48 ± 3 h of incubation at 30 ± 1 °C. The incubation period can be extended to 72 H.

Typical *Pseudomonas* spp. colonies appear pale blue to blue-green. No confirmation test is necessary.

Various inoculation protocols are available:

- surface inoculation via manual spreading,
- surface inoculation using the Spiral inoculator.

The corresponding protocol is given in **Appendix 3**.

3 INITIAL VALIDATION: RESULTS

3.1 Method comparative study

3.1.1 Linearity study

Linearity is defined as the method's ability, for a given matrix, to give results proportional to the amount of analyte in the sample, i.e. an increase in analyte corresponds to a linear or proportional increase in results.

3.1.1.1 Matrices used

For each food category, one type was selected with a representative matrix. Two batches of this matrix were inoculated with a single strain at low, intermediate and high inoculation rates. Five replicates were analysed for each batch and each inoculation rate, as described in table 1.

Table 1

Category	Type	Matrix	Strain	Inoculation rate (CFU/g)	
				Spreading	Spiral
Products products	Cured meat products	Duck mousse Batch 1 Batch 2	<i>Pseudomonas putida</i> 4	300 * 6,000 60,000	6,000 * 100,000 600,000
Dairy products	Dairy desserts	Cream dessert Batch 1 Batch 2	<i>Pseudomonas jesenii</i> Ad 1143		

* The low inoculation rate corresponds to at least 30 colonies counted on the plate inoculated with the 1/10 dilution.

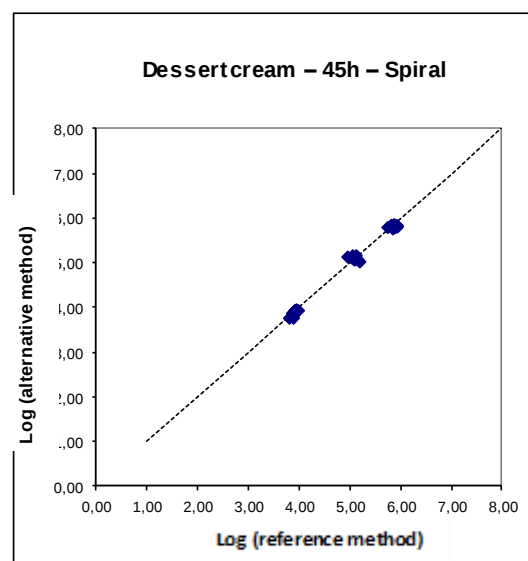
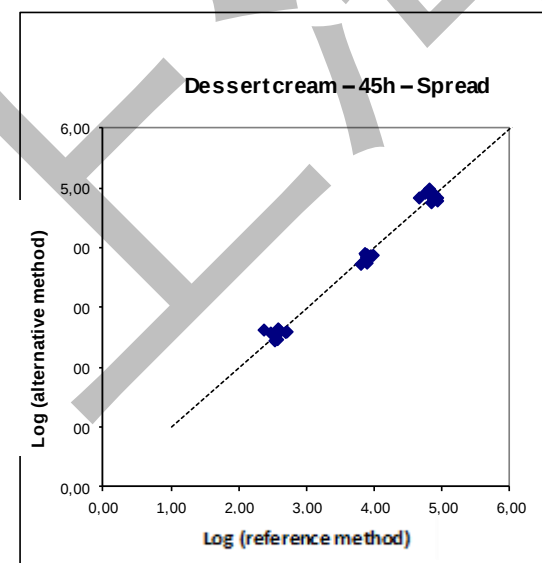
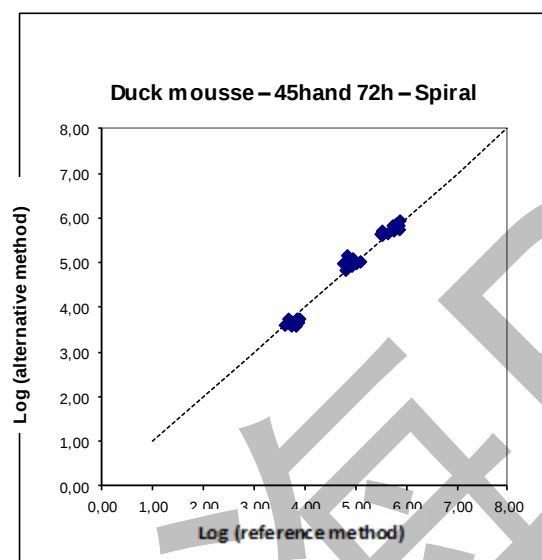
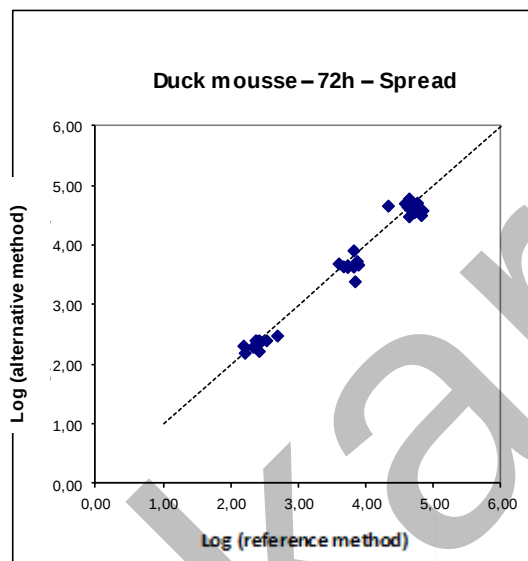
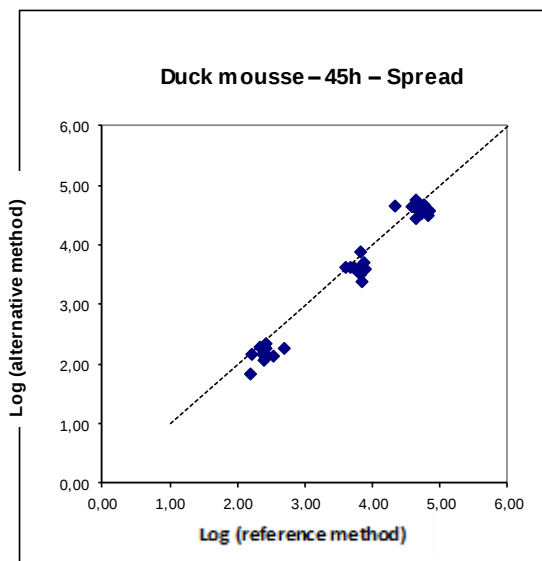
The RHAPSODY plates were incubated for 45 h at 30 ±1 °C.

3.1.1.2 Raw results

The two-dimensional plots are given in Figure 1. All of the results obtained per category are presented in **Appendix 4**.

A slight change in count was observed for duck mousse between 45 h and 72 h incubation for the spread method. Both interpretations are presented.

Figure 1 – Two-dimensional plots



3.1.1.3 Statistical interpretation

The results of the interpretations are given in table 2. The regression lines are given in Figure 2.

Figure 2 – Regression lines

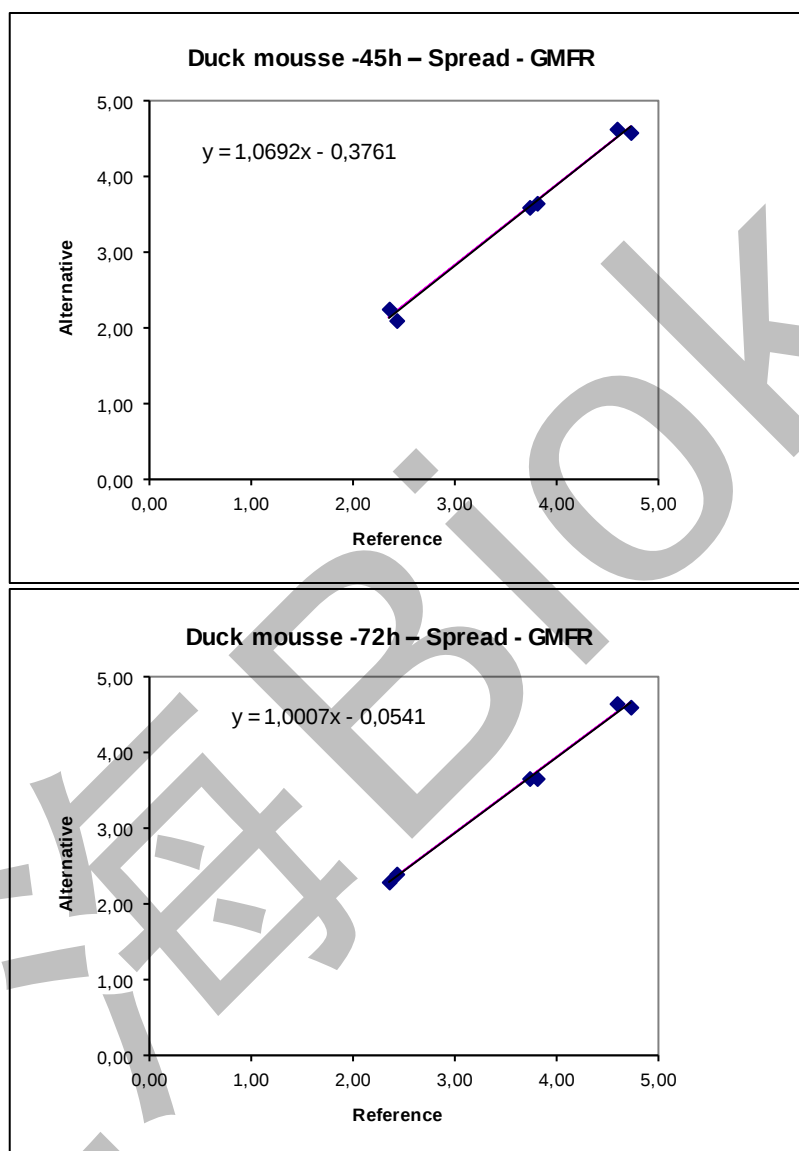


Figure 2 – Regression lines

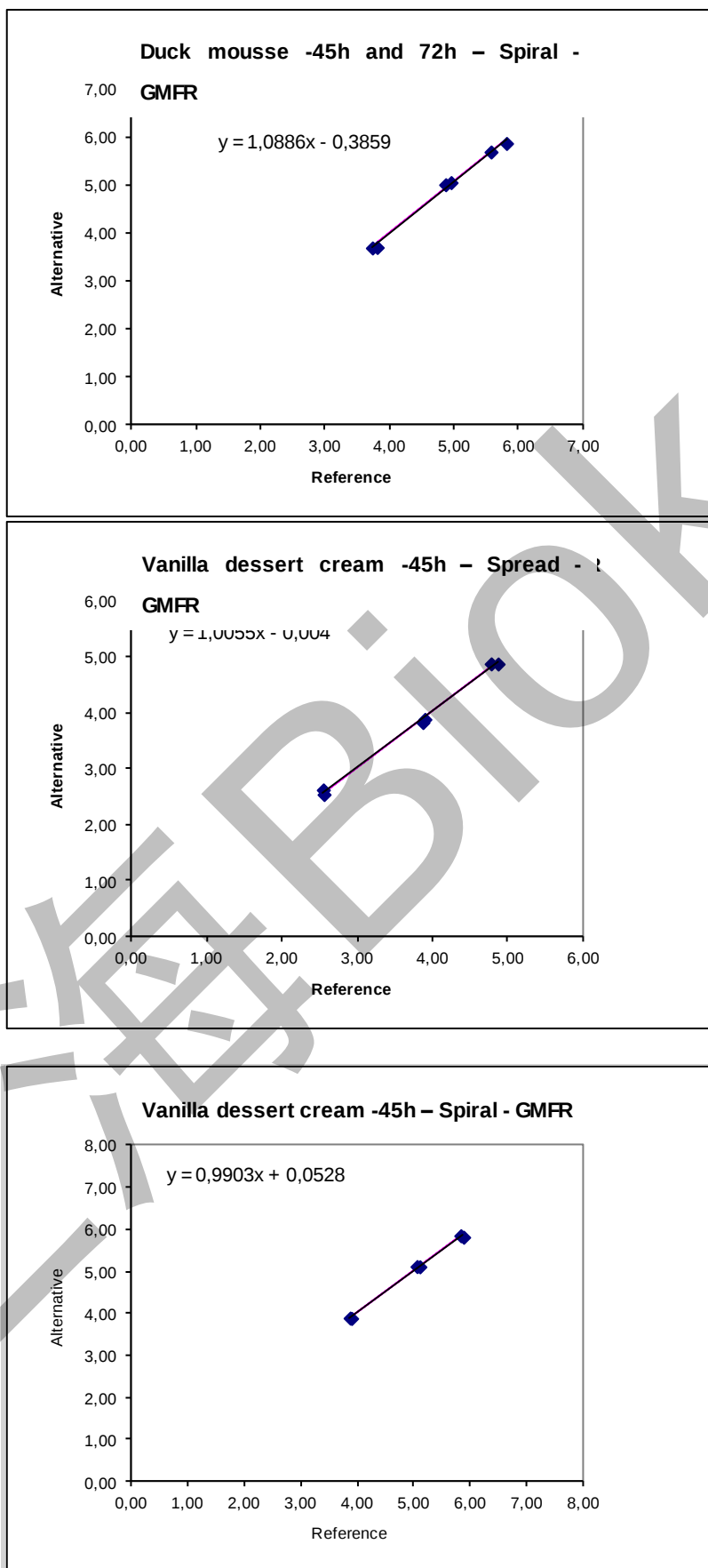


Table 2 - Statistical interpretation results

Matrix	Counting method	R	Regression used	Rob.F	Critical value	P%	Correlation coefficient	Regression line*
Duck mousse	Spreading 45 h	0.95	GMFR	12.51	2.120	0	0.996	$\log \text{Alt.} = 1.069 \log \text{Ref.} - 0.376$
	Spreading 72 h	0.72	GMFR	1.83	2.120	0	0.997	$\log \text{Alt.} = 1.000 \log \text{Ref.} - 0.054$
	Spiral 45 and 72 h	0.68	GMFR	11.82	2.120	0	0.998	$\log \text{Alt.} = 1.089 \log \text{Ref.} - 0.386$
Vanilla cream dessert	Spreading 45 h	0.98	GMFR	8.60	2.120	0	0.999	$\log \text{Alt.} = 1.006 \log \text{Ref.} - 0.004$
	Spiral 45 h	0.96	GMFR	9.74	2.120	0	0.999	$\log \text{Alt.} = 0.990 \log \text{Ref.} - 0.053$

* the choice of X and Y axes is determined by the chosen type of regression.

Statistical interpretation:

$P > 5\%$: not significant $1\% < P < 5\%$: significant
 $P < 1\%$: highly significant

Discussion

The linearity tests were significant for all test conditions ($P=0\%$), but with correlation coefficients very close of 1.00. This is known to compromise the robustness of the linearity test (lack-of-fit).

The RHAPSODY Agar method displays satisfactory linearity.

3.1.2 Accuracy study

Accuracy is the closeness of fit between the test result and the accepted reference value.

3.1.2.1 Number and type of samples

The number of samples analysed and processed per category and analytical protocol is given in table 3.

Table 3 - Number and type of samples

Categories	Type		Enumeration protocol	Number of samples analysed		Number of results processed	
				Duplicate	Single	Duplicate	Single
Meat products	a	Raw meat products, including frozen, non-frozen, seasoned	Spreading	8	8	8	8
			Spiral	8	8	5	5
	b	Raw poultry, including frozen, non-frozen, seasoned	Spreading	6	6	5	5
			Spiral	6	6	5	5
	c	Cured meat products	Spreading	12	12	6 (45 h) 7 (72 h)	6
			Spiral	12	12	5	5
	Total		Spreading	26	26	19 (45 h) 20 (72 h)	21
			Spiral	26	26	15	15
Dairy products	a	Heat-treated dairy products	Spreading	11	18	1 (45 h) 2 (72 h)	6
			Spiral	11	18	1	5
	b	Raw dairy products	Spreading	12	11	4	4
			Spiral	11	11	4	4
	c	Dairy desserts	Spreading	10	10	5	9
			Spiral	10	10	6	6
	Total		Spreading	33	30	10 (45 h) 11 (72 h)	18
			Spiral	32	39	11	15
	Total			Spreading	59	65	29 (45 h) 31 (72 h)
		Spiral	58	65	26	30	

The samples not used for statistical processing are presented in table 4 for meat products and in table 5 for dairy products.

Table 4 - Samples not used for statistical processing - Meat products

No. Spl.	Product	Reference method ISO 13720 [♦]		Alternative method: RHAPSODY Agar								Cause
		log CFU/g		Spread 45 h		Spread 72 h		Spiral 45 h		Spiral 72 h		
				log CFU/g		log CFU/g Spr. 72h		log CFU/g		log CFU/g		
		Rep 1	Rep 2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	
3938	Plan lardoons	<1.00	<1.00	<1.60	<1.00	<1.60	<1.00	<2.30	<2.30	<2.90	<2.30	threshold
4067	Salted pork belly	2.51	2.18	<1.00	<1.00	2.08	2.00	<2.90	<2.90	<2.90	<2.90	not counted at 45 h
4068	Muzzle pâté with parsley	2.46	2.48	2.04	2.20	2.11	2.23	<2.90	<2.90	<2.90	<2.90	threshold
4069	Pork muzzle with tongue	<2.00	<2.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
4070	Cooked ham	<1.60	<1.60	1.60	1.70	1.60	1.70	<2.30	<2.30	<2.90	<2.30	threshold
4244	Salami	<1.00	<1.60	<1.60	<1.00	<1.60	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
4245	Dried sausage	1.70	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
4248	Quail	<5.60	<5.60	<5.60	<5.60	<5.60	<5.60	4.68	4.68	4.83	4.70	inappropriate dilution
4439	Frozen minced steak	2.62	2.75	2.28	2.58	2.52	2.64	<2.90	<2.30	<2.90	<2.30	threshold
4441	Frozen top sirloin steak	2.36	2.36	2.11	2.00	2.32	2.20	<2.90	<2.30	<2.90	<2.30	threshold
4442	Frozen veal cutlet	2.41	2.68	2.00	2.36	2.15	2.45	<2.90	<2.30	<2.90	<2.90	threshold

♦ Test conducted under accreditation

Table 5 - Samples not used for statistical processing - Dairy products

No. Spl.	Product	Reference method XP/ISO TS 11059 [♦]		Alternative method: RHAPSODY Agar								Cause
		log CFU/g		Spread 45 h		Spread 72 h		Spiral 45 h		Spiral 72 h		
				log CFU/g		log CFU/g Spr. 72h		log CFU/g		log CFU/g		
		Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	
3943	Morbier made with raw milk	<2.00	<2.00	<1.60	<1.00	<1.60	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
3944	Raw cream	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
3945	Mozzarella	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
3946	Semi-skimmed pasteurised milk	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
4071	Country style Saint Nectaire	<3.00	<3.00	3.59	3.53	3.59	3.53	3.64	3.62	3.64	3.62	Background microflora
4074	Semi-skimmed pasteurised milk	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
4075	Semi-skimmed pasteurised milk	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
4249	Rice pudding	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30	threshold
4250	Chantilly (black forest)	3.28	3.30	2.90	3.28	3.04	3.30	<2.90	<2.90	<2.90	<2.90	threshold
4382	Nougat ice-cream	2.61	2.59	2.43	2.36	2.58	2.55	<2.90	<2.90	<2.90	<2.90	threshold
4383	Salted butter caramel ice-cream	2.18	2.41	2.08	1.95	2.41	2.16	<2.90	<2.90	<2.90	<2.90	threshold
4384	Semi-skimmed pasteurised milk	4.41	4.59	<3.00	<3.00	4.67	4.48	<2.30	<2.30	4.46	4.48	not counted at 45 h
4385	Fromage frais made with whole raw milk	<3.60	<3.60	<1.60	1.78	2.62	2.67	<2.90	<2.90	<2.90	<2.90	Background microflora
4450	Goat's cheese made with raw milk	>4.18	>4.18	>4.18	>4.18	>4.18	>4.18	/	/	/	/	threshold
4451	Pasteurised fresh cream	<1.00	<1.00	<1.00	<1.60	<1.00	<1.60	<2.30	<2.30	<2.30	<2.30	threshold
4452	Butter made with pasteurised milk	<1.00	<1.00	<2.60	<2.60	<2.60	<2.60	<2.30	<2.90	<2.30	<2.90	threshold
4453	Mozzarella	<3.00	<3.00	<3.60	<3.00	<3.60	<3.00	2.90	2.90	2.90	2.90	inappropriate dilution
4454	Mozzarella	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.90	<2.30	<2.90	<2.30	threshold
4552	Goat's cheese made with raw milk	<7.00	<7.00	/	/	/	/	6.45	7.32	6.36	6.41	Background microflora
4553	Ewe's cheese made with raw milk	<7.00	<7.00	/	/	/	/	4.30	4.20	4.30	4.20	Background microflora
4846	Bethmale	<3.00	<3.00	2.89	/	2.92	/	<2.90	2.90	<2.90	2.90	Background microflora

♦ Test conducted under accreditation

In most cases, the level of contamination was below the level of detection (9 in meat products and 14 in dairy products). In two cases (samples 4067 in meat products and 4384 in dairy products), there were no colonies after incubation for 45 h (sample 4067), or the colonies present were white (sample 4384).

For two samples, the dilution used was not suited to the level of contamination.

Finally, in five cases, counts were not possible by the reference method due to the presence of significant background microflora.

3.1.2.2 Artificial contaminants

Eleven samples were artificially contaminated with stressed strains. The strains inoculated, the injury protocol and the injury measurement are given in **Appendix 5**. Six samples gave usable results.

3.1.2.3 Raw results

The raw results are given in **Appendix 8**. An overview is given in **Appendix 9**.

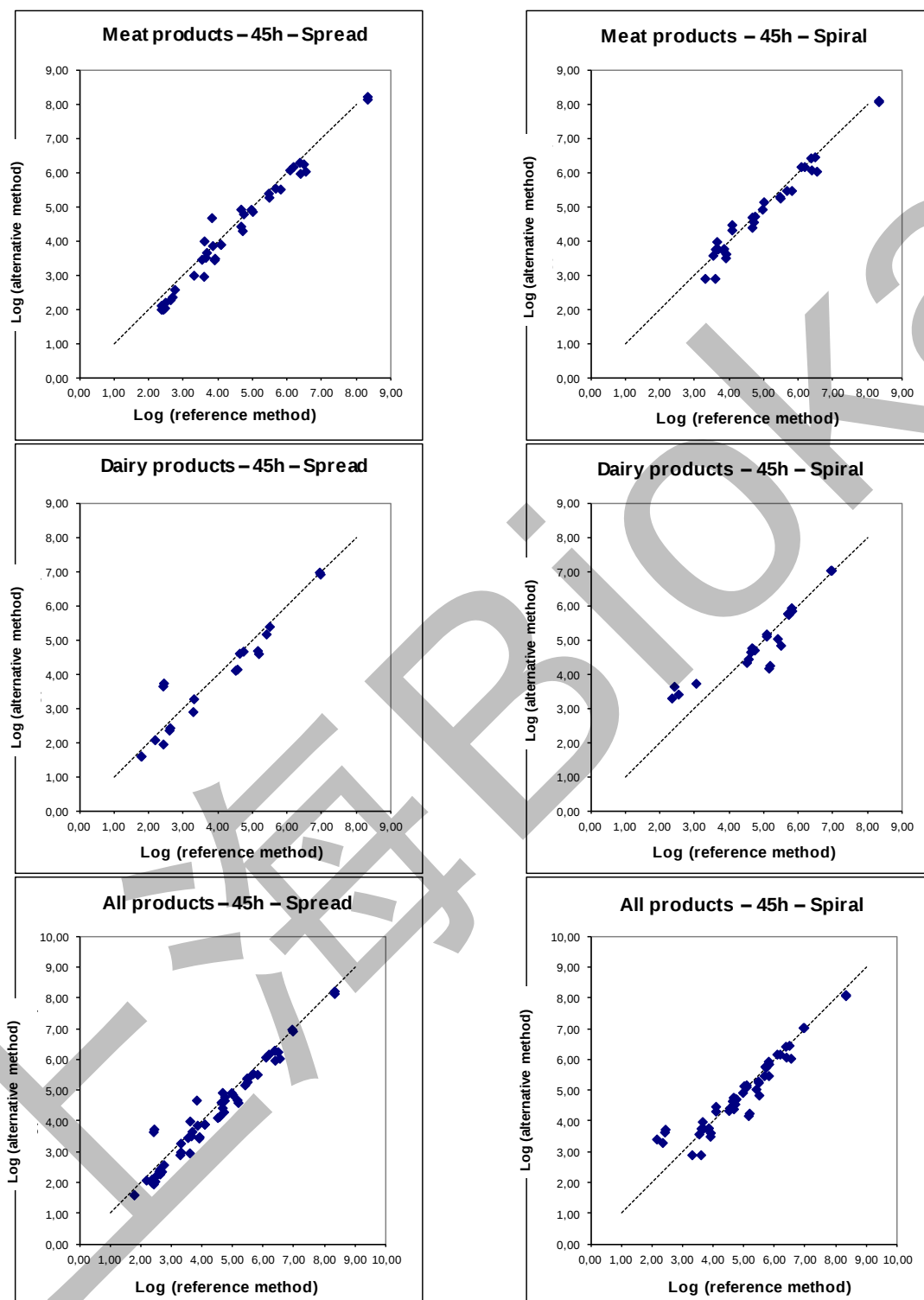
Samples were analysed in duplicate by each of the methods. The contamination domain is given by category in table 6.

Table 6 - Contamination domain

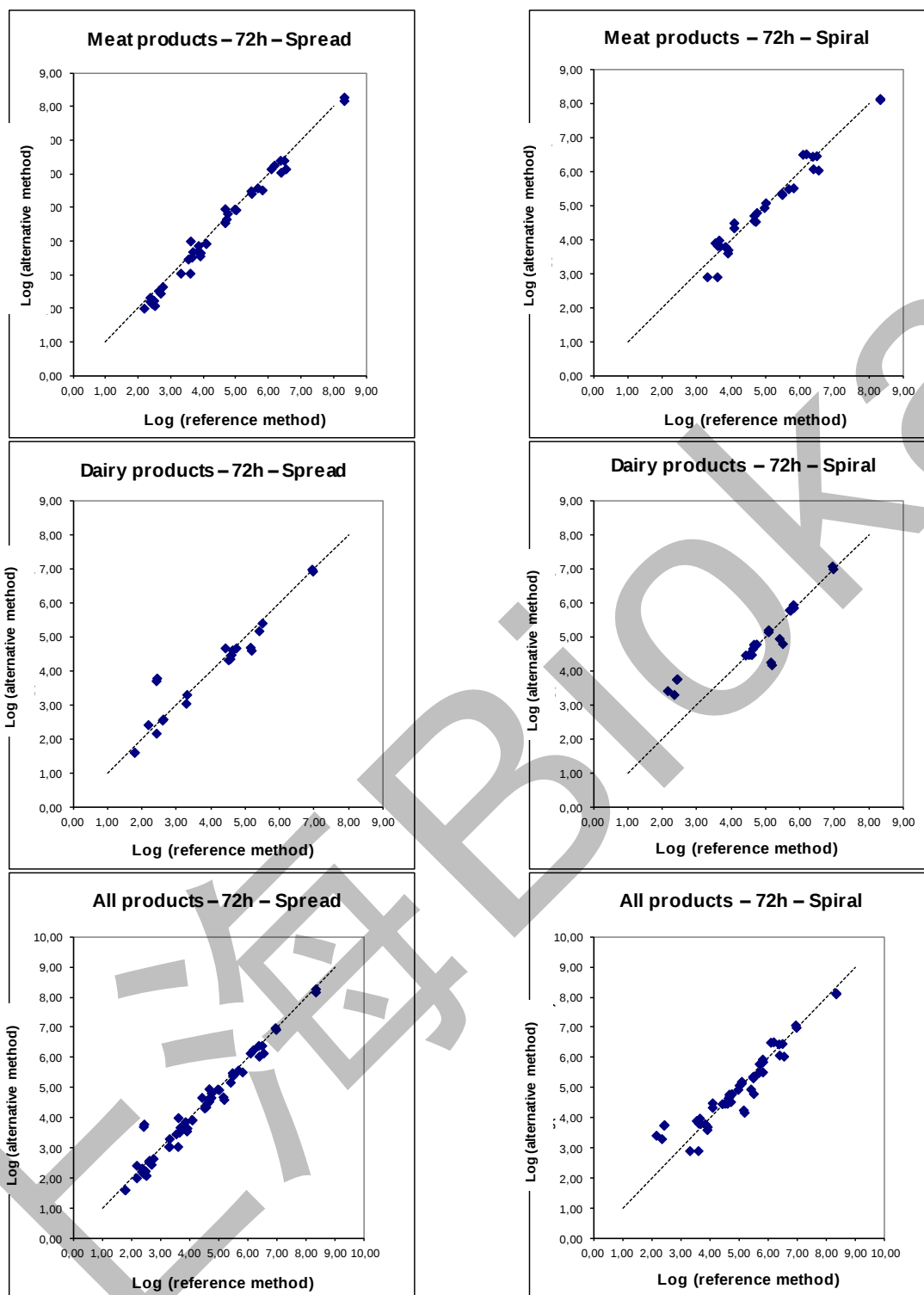
Category	Analytical method	Contamination domain (log CFU/g)	
		45 h	72 h
Meat products	Spreading	2.00 to 8.32	2.00 to 8.32
	Spiral	2.90 to 8.32	2.90 to 8.32
Dairy products	Spreading	1.60 to 6.99	1.60 to 6.99
	Spiral	2.15 to 7.04	2.15 to 7.08
All products	Spreading	1.60 to 8.32	1.60 to 8.32
	Spiral	2.15 to 8.32	2.15 to 8.32

The two-dimensional plots are given in figure 4 and the regression lines in figure 5.

Figure 3 – Two-dimensional plots
Incubation: 45 h



Incubation: 72 h



The statistical interpretation results are given in tables 7 and 9, while the regression lines are given in figure 4.

Table 7 - Statistical interpretations - 45 h incubation

Category	Alternative	n	R	Regression used	a	t(a)	b	t(b)	T critical	P%	
										Slope of 1	Ordinate at 0
Meat products	Spreading	19	1.00	GMFR	- 0.293	1.745	1.029	0.814	2.110	10	43
	Spiral	15	0.36	OLS2	0.093	0.538	1.001	0.025	2.160	59	98
Dairy products	Spreading	10	2.88	OLS1	0.210	0.514	0.929	0.735	2.306	61	47
	Spiral	11	3.07	OLS1	1.626	3.218	0.684	3.112	2.262	0	1
All products	Spreading	29	1.70	GMFR	- 0.150	0.809	1.005	0.111	2.052	43	91
	Spiral	26	1.04	GMFR	0.583	1.732	0.892	1.826	2.064	10	8

Table 8

Category	Alternative	Biais D (median)	Repeatability alternative method	Repeatability reference method
Meat products	Spreading	- 0.179	0.291	0.284
	Spiral	0.002	0.104	0.284
Dairy products	Spreading	- 0.188	0.235	0.08
	Spiral	0.066	0.237	0.076
All products	Spreading	- 0.179	0.261	0.150
	Spiral	0.019	0.150	0.141

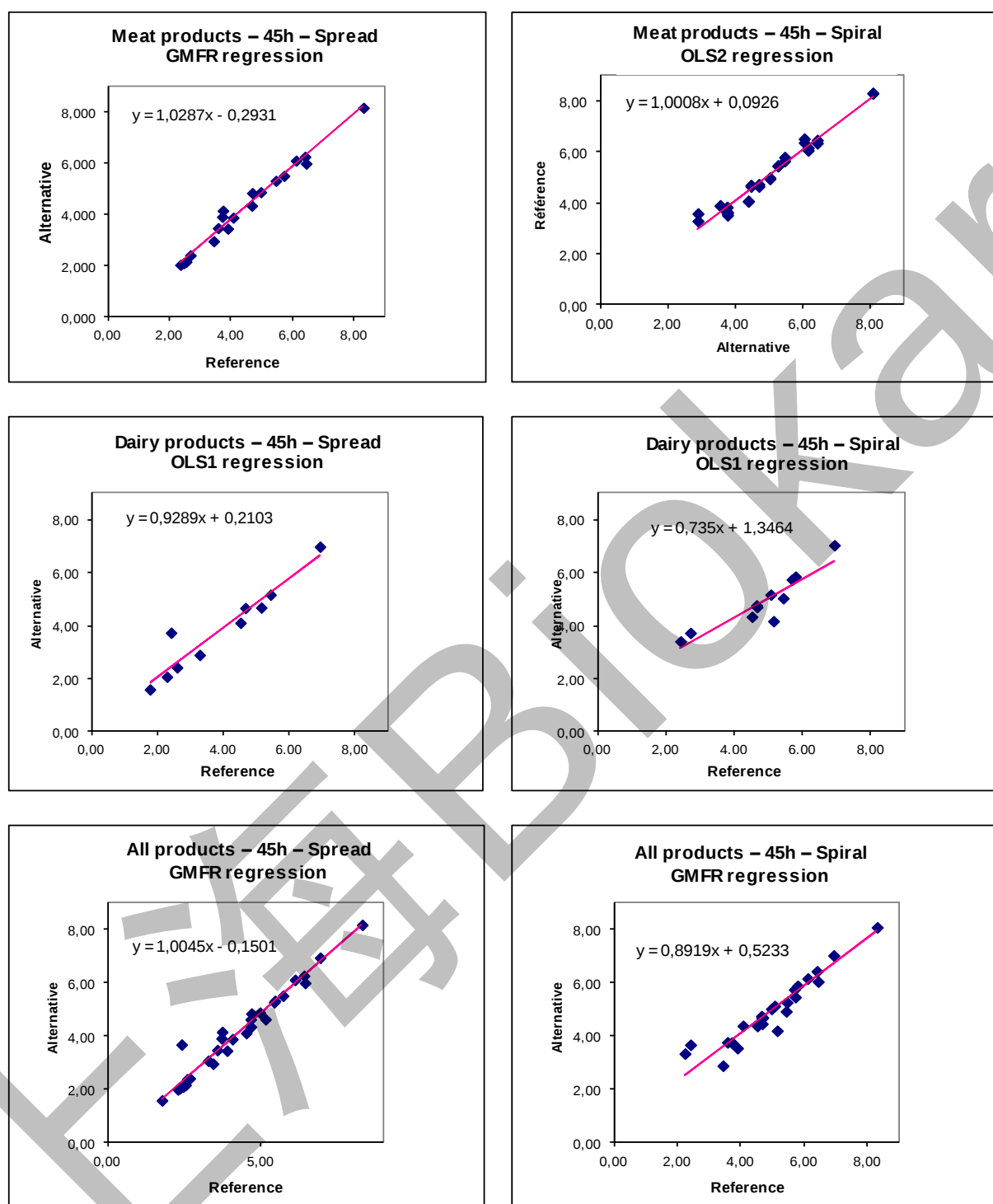
Table 9 - Statistical interpretations - 72 h incubation

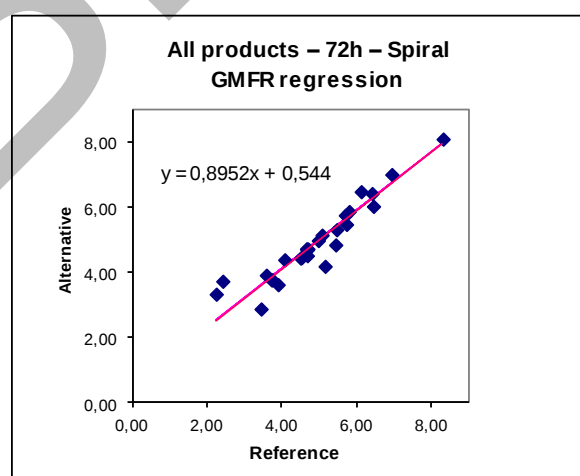
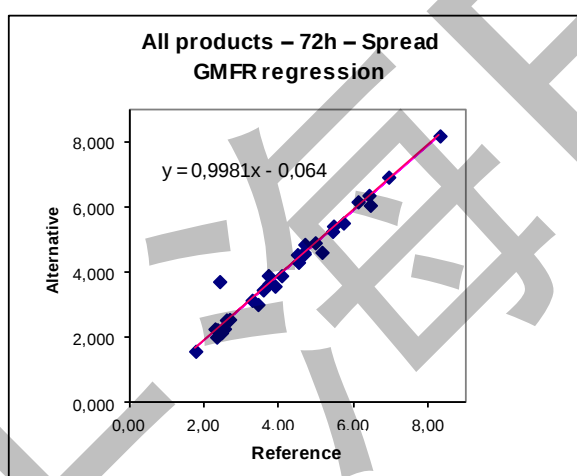
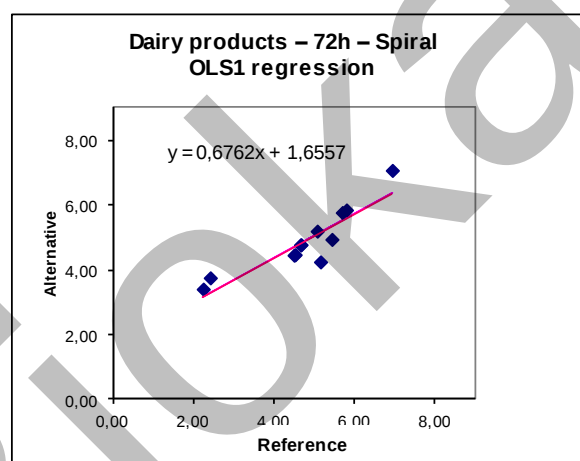
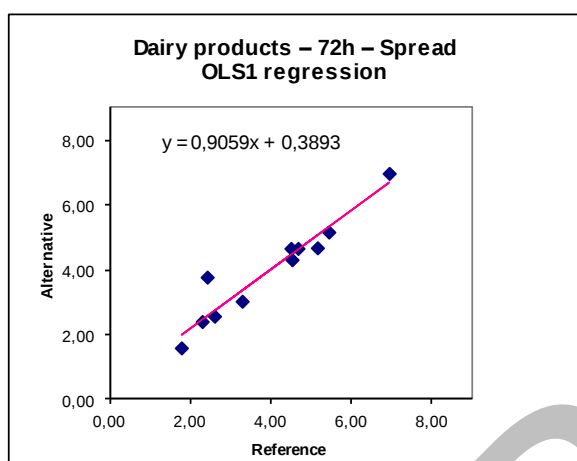
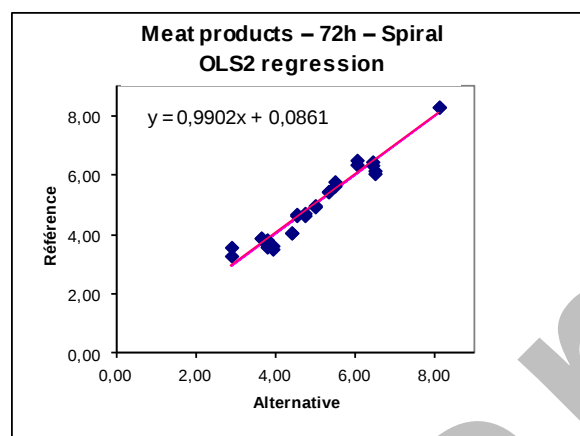
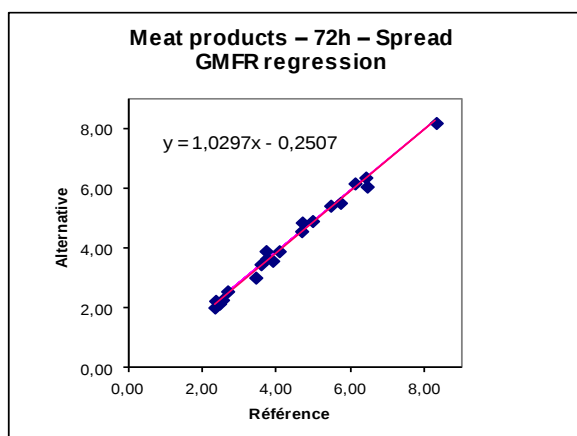
Category	Alternative	n	R	Regression used	a	t(a)	b	t(b)	T critical	P%	
										Slope of 1	Ordinate at 0
Meat products	Spreading	20	0.96	GMFR	- 0.251	2.307	1.030	1.279	2.101	22	3
	Spiral	15	0.39	OLS2	0.086	0.437	0.990	0.256	2.160	80	67
Dairy products	Spreading	11	2.62	OLS1	0.389	1.050	0.906	1.079	2.262	29	31
	Spiral	12	2.46	OLS1	1.656	3.368	0.676	3.248	2.228	0	0
All products	Spreading	31	1.14	GMFR	- 0.064	0.403	0.998	0.053	2.045	96	69
	Spiral	27	0.81	GMFR	0.544	1.770	0.895	1.734	2.060	10	9

Table 10

Category	Alternative	Biais D (median)	Repeatability alternative method	Repeatability reference method
Meat products	Spreading	- 0.098	0.299	0.307
	Spiral	0.039	0.113	0.284
Dairy products	Spreading	- 0.037	0.235	0.088
	Spiral	0.087	0.206	0.082
All products	Spreading	- 0.097	0.264	0.228
	Spiral	0.041	0.124	0.150

Figure 4 – Regression lines





Discussion

The slope at 1 and ordinate at 0 hypotheses are verified in all cases, except for the dairy products analysed by the Spiral method.

Count differences were observed between the reference method and the alternative method in this category for artificially contaminated samples, particularly for samples 4555 and 4556.

The PPA (piperacillin and pimaricin agar) plates of the reference method were re-incubated to 72 h for these samples. A change in count was observed, though the levels achieved with the RHAPSODY Agar were not reached. The results obtained were as follows:

Table 11

Spl. no.	PPA		RHAPSODY	
	45 h	72 h	45 h	72 h
4555	2.43 – 2.41	3.04 – 3.04	3.73 – 3.64	3.76 – 3.75
4556	2.15 – 2.34	2.53 – 2.58	3.41 – 3.30	3.41 – 3.30
4557	3.75	4.04	4.45	4.46
4558	3.32	3.53	3.89	3.90
4559	4.26	4.54	4.08	4.15
4560	3.79	4.04	4.23	4.26

RHAPSODY Agar enables improved recovery of stressed micro-organisms; the confirmation tests characteristically *Pseudomonas* spp.

The biases observed were perfectly acceptable, varying between -0.098 and 0.87 log CFU/g.

The limits of repeatability of the alternative method varied between 0.113 and 0.229 log CFU/g; those of the reference method varied between 0.082 and 0.307 log CFU/g.

The RHAPSODY Agar demonstrates satisfactory accuracy compared to the NE EN ISO 13720 and XP/ISO TS 11059 methods for the enumeration of *Pseudomonas* spp. in meat and dairy products. It offers improved recovery of stressed *Pseudomonas* spp. cells relative to the reference method.

3.1.3 Limit of detection (LOD) and limit of quantification (LOQ)

The limit of detection (LOD) is defined as the level above the critical level.

The limit of quantification (LOQ) is defined as the smallest amount of analyte (i.e. the smallest actual number of micro-organisms) that can be measured and quantified with a degree of accuracy and reliability defined by the experimental conditions of the method being validated.

3.1.3.1 Protocol

The method's limit of detection was determined in pure culture. Three minimum inoculation rates were tested, six replicates per rate, i.e. eighteen analyses for each alternative method protocol. The *Pseudomonas putida* Ad 1331 strain was used for the tests.

3.1.3.2 Results

All results are given in **Appendix 8**.

An overview of the results obtained is given in table 12.

Table 12

	Spreading method		Spiral method
	1 ml onto 3 plates	0.1 ml onto 1 plate	
LC	1.4	21.2	28.1
LOD	2.3	37.4	46.1
LOQ	6.0	103.3	119.5

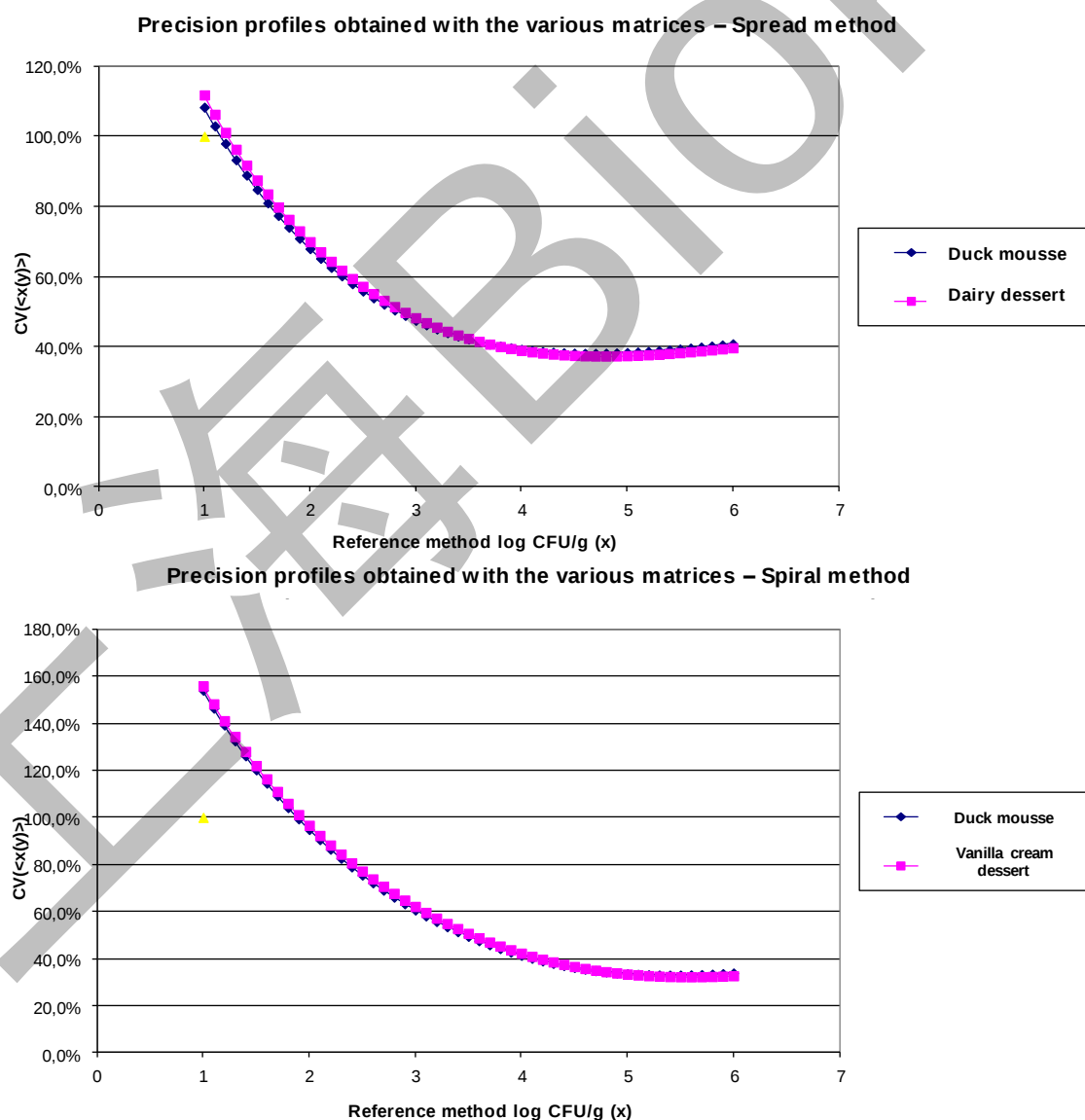
3.1.4 Relative sensitivity

Relative sensitivity is defined as the alternative method's ability to detect two different amounts of analyte previously measured by the reference method, using a given matrix, over the entire measurement range. The variation in minimum quantity (increase in analyte x concentration) that gives a significant variation in measured signal (response y).

The data are intrinsic to the method. They are derived from the results obtained in the linearity study.

The precision profiles obtained for the various matrices (incubation period: 45 h) are shown in Figure 5.

Figure 5



3.1.5 Inclusivity / Exclusivity

Specificity is defined as the degree to which the method is affected (or not) by the other components in a multi-component sample. It represents the method's ability to accurately measure or quantify a given analyte in a sample without interference from other non-target components, such as for example a matrix effect or background noise.

Selectivity is defined as a measure of the degree of non-interference in the presence of non-target analytes. A method is said to be selective if it can be used to detect the desired analyte and if it is certain that the detected signal is generated exclusively by the concerned analyte.

3.1.5.1 Test protocols

Inclusivity

Fifty strains of *Pseudomonas* were tested and enumerated in parallel using the two reference methods and the alternative spread method. A count was performed in parallel by spreading onto PCA agar.

Exclusivity

Thirty one negative strains were enumerated as previously described.

3.1.5.2 Results

The results are given in **Appendix 9**.

Inclusivity

On the 50 strains tested, 2 failed to grow on RHAPSODY Agar (*Pseudomonas otitidis* Ad 1880 and *Pseudomonas* sp. Ad 2005). 9 strains gave pale blue or white (1 strain) colonies after incubation for 45 h, though they were typical after 72 h incubation.

Exclusivity

Amongst the 30 strains tested, 2 grew on RHAPSODY Agar giving either blue micro-colonies (*Pandorea* sp. Ad 1882) after 45 h, or cream-coloured colonies (*Okibacterium fritillariae* Ad 1117). After incubation for 72 h, the cream-coloured colonies turned pale green; this strain also showed growth

on CFC and PPA agar, though the colonies were not confirmed (oxidase-negative strain). Three strains grew on the reference method PPA agar, giving confirmation tests indicating the presence of *Pseudomonas* (oxidase + and BCP glucose -). These were strains of *Chryseobacterium ureilyticum* Ad 1340, *Flavobacterium hydratis* Ad 1323, and *Okibacterium pseudo intermedius* Ad 1057.

3.2 Practicability

Practicability was evaluated according to the thirteen criteria defined in the validation study requirements:

✓ Conditioning of the method elements	Pack of 20 pre-poured plates
✓ Reagent volumes	The plates are filled with 18 ml agar.
✓ Item storage conditions and expiry of unopened products	The agar plates can be stored for up to 4 months at 2-8 °C.
✓ Conditions of use after first use	Not applicable
✓ Specific equipment or rooms required	Equipment routinely present in a microbiology laboratory
✓ Ready-to-use or powdered reagents	Not applicable
✓ Training time for uninitiated operators	No specific training required

✓ Actual manipulation time and method flexibility	<i>Time in minutes for negative samples</i>			
	For 10 samples	Reference method		Alternative method
		ISO 13720	ISO 11059	Spreading Spiral
	Sampling, crushing	60	60	60 60
	Analysis	100	100	100 30
	Reading	5	5	5 5
	<i>Time in minutes for positive samples, or samples displaying suspicious colonies</i>			
	For 10 samples	Reference method		Alternative method
		ISO 13720	ISO 11059	Spreading Spiral
	Sampling, crushing	60	60	60 60
	Analysis	100	100	100 30
	Reading	30	30	30 30
	Oxidase test	40	/	/ /
	Isolation	/		
	Oxidase test - BCP	/	160	
	BCP reading	/	7	
✓ Time to result	<i>If there are no suspicious colonies on the plates, the times to results are as follows:</i>			
	Step	Reference method		Alternative method
		ISO 13720	ISO 11059	
	Sampling, analysis	D0	D0	D0
	Counts	D2	D2	D2
	Oxidase test	D2	/	
	<i>If colonies are visible on the selective plates, the times to results are as follows:</i>			
	Step	Reference method		Alternative method
		ISO 13720	ISO 11059	
	Sampling, analysis	D0	D0	D0
	Counts	D2	D2	D2
	Oxidase test	D2	/	/
	Isolation	/	D2	/
	Oxidase test and BCP	/	D3	/
	BCP reading	/	D4	/

✓ Type of operator qualification	This is identical to that required to use the reference method.
✓ Steps common with the reference method	The preparation of stock suspensions and dilutions is common to both methods.
✓ Traceability of results	Traceability is generally that applied in a microbiology laboratory
✓ Maintenance by the laboratory	Not applicable

3.3 Inter-laboratory study

3.3.1 Study organisation

Sixteen laboratories took part in the inter-laboratory study. The expert laboratory provided detailed instructions to these laboratories by email on 02 March 2015.

The study was conducted on smoked ham rolls (i.e. speciality cheese), inoculated with *Pseudomonas fluorescens* Ad 2249 isolated from raw milk.

The inoculation rates were as follows:

- 0 CFU/g,
- 1,000 CFU/g,
- 10,000 CFU/g,
- 100,000 CFU/g.

The samples were inoculated and shipped on Monday 16 March 2015. Each partner laboratory received 8 encoded samples (10 g) for the enumeration of *Pseudomonas* spp. by the RHAPSODY Agar alternative method and by the NF EN ISO 13720 (November 2010) and XP ISO/TS 11059 (October 2009) reference methods.

An additional uninoculated sample was appended to the package for enumeration of the aerobic mesophilic flora via the NF ISO 4833-1 method.

The coded samples (code known only to the expert laboratory) were placed in isothermal boxes containing refrigerant blocks and shipped to the various laboratories by means of an express transport system.

A control bottle containing water and a temperature probe was added to each package to monitor temperature during transport, upon receipt and during storage by the laboratory until analysis.

The samples were delivered to the partner laboratories within 24 h.

The partner laboratories and the expert laboratory analysed the samples using the reference methods and the alternative method on Wednesday 18 March 2015 (D2).

3.3.2 Experimental parameter control

3.3.2.1 Strain stability during transport

In order to check the stability of the *Pseudomonas fluorescens* Ad 2249 strain, a count was performed in duplicate on all three inoculation rates on the day of inoculation, then after 24 h and 48 h of storage at 2-8 °C. The corresponding results are given in table 13.

Table 13 - Enumeration of *Pseudomonas* by the RHAPSODY Agar alternative method and reference methods (in CFU/g)

	Rate 1			Rate 2			Rate 3			Mesophilic aerobic microflora
	RHAPSODY Agar	CFC ¹	PPA ²	RHAPSODY Agar	CFC	PPA	RHAPSODY Agar	CFC	PPA	
D0	770	970	890	8900	10000	7600	88000	86000	83000	4,2.106
	970	1100	760	10000	9700	8900	80000	110000	81000	
D2	510	570	630	6200	4200	4600	49000	39000	59000	2,5.107
	390	450	430	6900	5600	7000	63000	63000	37000	

A drop in *Pseudomonas* counts was observed for all three methods after storage for 48 h at 2-8 °C.

¹ CFC: ISO 13720 method

² PPA: XP ISO/TS 11059 method

3.3.2.2 Sample temperature upon receipt

The temperatures measured upon receipt of the samples are given in table 14.

Table 14 - Sample temperature upon receipt

Laboratories	Temperature measured by the probe (°C)	Temperature measured upon receipt (°C)	Date and time of sample receipt	
A	1.0	1.8	17/03/2015	08:45
B	1.5	2.7	17/03/2015	09:15
C	2.0	3.5	17/03/2015	11:45
D	1.0	2.0	17/03/2015	08:30
E	2.0	2.3	17/03/2015	09:00
F	2.0	3.6	17/03/2015	08:35
G	1.0	2.5	17/03/2015	09:00
H	1.5	3.6	17/03/2015	08:35
I	1.0	2.9	17/03/2015	09:55
J	3.5	3.1	17/03/2015	10:00
K	1.0	4.5	17/03/2015	10:15
L	0.5	<i>Not measured</i>	17/03/2015	10:00
M	2.0	2.5	17/03/2015	12:40
N	2.0	9.0	17/03/2015	12:30
O	1.5	2.5	17/03/2015	12:45
P	2.0	6.1	17/03/2015	11:30

All packages were delivered within 24 h. One laboratory (N) measured a temperature of 9.0 °C upon receipt, but the temperature recording indicated a temperature of 2.0 °C.

One laboratory (L) failed to measure the temperature upon receipt, but the probe indicated a temperature of 0.5 °C.

3.3.2.3 Sample temperature during transport

No anomalies were observed during transport.

3.3.3 Analysis results

3.3.3.1 Enumeration of the mesophilic aerobic flora

The mesophilic aerobic flora on the matrix was enumerated as per the ISO 4833-1 method. Results varied between 90 CFU/g and 5.9x10⁶ CFU/g.

3.3.3.2 Results obtained by the expert laboratory

The results obtained by the expert laboratory, using the reference methods and the alternative method, are given in table 15.

Table 15 - Expert laboratory results (in log CFU/g)

Target rate (log CFU/g)	Reference method ♦		Alternative method RHAPSODY Agar
	ISO 13720	ISO XP/TS 11059	
< 1	< 1.00	< 1.00	< 1.00
	< 1.00	< 1.00	< 1.00
3.0	3.00	3.23	3.20
	3.15	3.04	3.18
4.0	3.99	4.00	3.98
	4.11	4.15	4.11
5.0	5.08	5.04	5.08
	5.00	5.00	5.00

The expert laboratory's raw results are given in **Appendix 10**.

3.3.3.3 Results obtained by the partner laboratories

The raw results of the partner laboratories are given in **Appendix 11**.

Sixteen laboratories took part in the study; two failed to observe the protocol described in the instructions provided. Indeed, the 1/100 dilution was not performed (0.1 ml of the stock suspension was spread). These two laboratories (H and L) were not included in the statistical interpretation.

♦ Test conducted under accreditation

3.3.4 Calculations and statistical interpretation

✓ DEFINITIONS

- ↳ *Accuracy*: "Closeness of fit between the test result and the accepted reference value".
- ↳ *Reliability*: "Closeness of fit between independent test results obtained under the stipulated conditions of repeatability and reproducibility".
- ↳ *Repeatability*: "Closeness of fit between successive and independent results obtained using the same method, identical test material and under identical conditions (instrumentation, operator, laboratory and short time spans, i.e. under conditions of repeatability)".
- ↳ *Limit of repeatability* (r): "Value less than or equal to which the absolute difference between two test results obtained under conditions of repeatability is expected with a probability of 95%".
- ↳ *Reproducibility*: "Closeness of fit between the results of individual tests performed using identical test material and the same method, obtained by operators from different laboratories using different equipment (i.e. under conditions of reproducibility)".
- ↳ *Limit of reproducibility* (R): "Value less than or equal to which the absolute difference between two test results obtained under conditions of reproducibility is expected with a probability of 95%".

3.3.4.1 Reference method NF EN ISO 13720 / alternative method RHAPSODY Agar

A summary of the results obtained by both methods is presented in Tables 16 (CFU/g) and 17 (log CFU/g).

Table 16 - Summary of results obtained by the RHAPSODY Agar alternative method and the NF EN ISO 13720 reference method (CFU/g)

Laboratories	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	1600	1300	1300	1300	7800	7500	10000	11000	100000	200000	130000	120000
B	<10	<10	<10	<10	430	400	850	850	2500	3600	2100	910	28000	13000	15000	10000
C	<10	<10	<10	<10	700	410	2000	1600	7900	6200	12000	11000	99000	120000	140000	150000
D	<10	<10	<10	<10	1000	940	1400	1500	12000	9100	13000	12000	130000	150000	140000	190000
E	<10	<10	<10	<10	2500	7000	930	1200	15000	11000	8200	7500	330000	110000	85000	88000
F	<10	<10	<10	<10	1200	4100	1500	670	6600	9400	6800	6500	85000	130000	85000	74000
G	<10	<10	<10	<10	1100	930	1400	1200	11000	18000	7400	11000	270000	100000	140000	81000
I	<10	<10	<10	<10	1500	1500	1600	1500	11000	9500	7800	11000	120000	150000	100000	130000
J	<10	<10	<10	<10	720	730	1300	1700	6300	5500	9600	8500	74000	77000	76000	85000
K	<10	<10	<10	<10	530	260	670	680	7100	7000	7500	7100	110000	82000	88000	140000
M	<10	<10	<10	<10	1500	1100	1500	2000	21000	15000	10000	12000	230000	430000	150000	180000
N	<10	<10	<10	<10	1200	910	1800	1800	15000	9000	14000	22000	87000	130000	150000	140000
O	<10	<10	<10	<10	1300	1400	1200	1900	12000	15000	13000	13000	230000	110000	120000	130000
P	<10	<10	<10	<10	930	1100	1400	1800	11000	11000	8000	11000	150000	150000	210000	130000

Table 17 - Summary of results obtained by the RHAPSODY Agar alternative method and the NF EN ISO 13720 reference method (log CFU/g)

Laboratories	Level 0				Level 1				Level 2				Level 3			
	Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method	
A	<1.00	<1.60	<1.00	<1.00	3.204	3.114	3.114	3.114	3.892	3.875	4.000	4.041	5.000	5.301	5.114	5.079
B	<1.00	<1.00	<1.00	<1.00	2.633	2.602	2.929	2.929	3.398	3.556	3.322	2.959	4.447	4.114	4.176	4.000
C	<1.00	<1.00	<1.00	<1.00	2.845	2.613	3.301	3.204	3.898	3.792	4.079	4.041	4.996	5.079	5.146	5.176
D	<1.00	<1.00	<1.00	<1.00	3.000	2.973	3.146	3.176	4.079	3.959	4.114	4.079	5.114	5.176	5.146	5.279
E	<1.00	<1.00	<1.00	<1.00	3.398	3.845	2.968	3.079	4.176	4.041	3.914	3.875	5.519	5.041	4.929	4.944
F	<1.00	<1.00	<1.00	<1.00	3.079	3.613	3.176	2.826	3.820	3.973	3.833	3.813	4.929	5.114	4.929	4.869
G	<1.00	<1.00	<1.00	<1.00	3.041	2.968	3.146	3.079	4.041	4.255	3.869	4.041	5.431	5.000	5.146	4.908
I	<1.00	<1.00	<1.00	<1.00	3.176	3.176	3.204	3.176	4.041	3.978	3.892	4.041	5.079	5.176	5.000	5.114
J	<1.00	<1.00	<1.00	<1.00	2.857	2.863	3.114	3.230	3.799	3.740	3.982	3.929	4.869	4.886	4.881	4.929
K	<1.00	<1.00	<1.00	<1.00	2.724	2.415	2.826	2.833	3.851	3.845	3.875	3.851	5.041	4.914	4.944	5.146
M	<1.00	<1.00	<1.00	<1.00	3.176	3.041	3.176	3.301	4.322	4.176	4.000	4.079	5.362	5.633	5.176	5.255
N	<1.00	<1.00	<1.00	<1.00	3.079	2.959	3.255	3.255	4.176	3.954	4.146	4.342	4.940	5.114	5.176	5.146
O	<1.00	<1.00	<1.00	<1.00	3.114	3.146	3.079	3.279	4.079	4.176	4.114	4.114	5.362	5.041	5.079	5.114
P	<1.00	<1.00	<1.00	<1.00	2.968	3.041	3.146	3.255	4.041	4.041	3.903	4.041	5.176	5.176	5.322	5.114



Measurement result consistency check

Consistency plots were applied to identify any inconsistent results relative to the whole: these are robust Mandel h (inter-laboratory consistency) and k (intra-laboratory consistency) statistics.

The plots obtained for the reference method and alternative method are given in **Appendix 12**. The values below the h and k thresholds are given in the table below:

Table 18

Mandel values	Number of below-threshold values observed			
	NF EN ISO 13720 reference method		RHAPSODY Agar alternative method	
h > 1%	Lab B	Level 3	Lab B	Levels 2 and 3
			Lab K	Level 1
h > 5 %	Lab B	Levels 2 and 3	Lab B	Levels 1, 2 and 3
	Lab E	Level 1	Lab K	Level 1
k > 1%	Lab E	Level 1	Lab B	Level 2
	Lab F	Level 1	Lab F	Level 1
k > 5%	Lab E	Level 1	Lab B	Level 2
	Lab F	Level 1	Lab F	Level 1

After close examination of the values, it did not seem justified to exclude a laboratory.



Biais

In order to estimate the bias of the alternative method relative to the reference method for each level, D_{ij} and t were calculated using the following equations:

$$D_{ij} = \bar{Y}_{ij, Alt} - \bar{Y}_{ij, Ref}$$

$$t = \frac{|\text{median } i(D_{ij})|}{\sqrt{\pi / (2 p) \phi \text{ Diff}}}$$

If the value of t is greater than 2, the alternative method is significantly biased relative to the reference method.

Table 19 - Values of t(d) obtained per level

Level	Biais D	t(d)	Conclusion
1	0.162	1.89	Non-significant bias
2	- 0.028	0.40	Non-significant bias
3	- 0.062	1.14	Non-significant bias

The bias is non-significant for the three levels tested.



Comparison of accuracy and reliability characteristics of the reference method and alternative method

Statistical calculations are given in **Appendix 13**. An overview of the results obtained is given in the table below.

Table 20

Level	NF EN ISO 13720 reference method			RHAPSODY Agar alternative method		
	Median	Repeatability standard deviation	Repeatability standard deviation	Median	Repeatability standard deviation	Repeatability standard deviation
1	3.012	0.120	0.282	3.167	0.093	0.133
2	4.014	0.098	0.210	3.969	0.081	0.147
3	5.136	0.200	0.234	5.077	0.090	0.170



Comparison of repeatability standard deviations

If the ratio of repeatability standard deviations of the alternative method to those of the reference method is greater than 2, the reliability under conditions of repeatability of the alternative method is considered inferior to that of the reference method. If this ratio is greater than 0.5, the reliability of the alternative method is considered to be superior to that of the reference method.

The values of these ratios are given in the table below.

Table 21 - Repeatability standard deviation ratios

Level of contamination	Reference method NF EN ISO 13720		Alternative method RHAPSODY Agar		Ratio Sr Alt. / Sr Ref.
	Sr Ref.	r Ref.	Sr Alt.	r Alt.	
1	0.120	0.335	0.093	0.259	0.774
2	0.098	0.275	0.081	0.226	0.821
3	0.202	0.564	0.090	0.253	0.448

The ratios of the repeatability standard deviations are all less than 2; **the reliability under conditions of repeatability of the alternative method is considered to be equivalent to that of the reference method.**



Comparison of reproducibility standard deviations

If the ratio of reproducibility standard deviations of the alternative method to those of the reference method is greater than 2, the reliability under conditions of reproducibility of the alternative method is considered inferior to that of the reference method. If this ratio is greater than 0.5, the reliability of the alternative method is considered to be superior to that of the reference method.

The values of these ratios are given in the table below.

Table 22 - Reproducibility standard deviation ratios

Level of contamination	Reference method NF EN ISO 13720		Alternative method RHAPSODY Agar		Ratio SR Alt/SR Ref.
	SR Ref.	R Ref.	SR Alt.	R Alt.	
1	0.282	0.790	0.133	0.373	0.472
2	0.210	0.587	0.147	0.413	0.703
2	0.234	0.654	0.170	0.477	0.729

The ratios of the reproducibility standard deviations are all less than 2; the reliability under conditions of reproducibility of the alternative method is considered to be equivalent to that of the reference method.

3.3.4.2 ISO XP/TS 11059 reference method / RHAPSODY Agar alternative method

A summary of the results obtained by both methods is presented in Tables 23 (CFU/g) and 24 (log CFU/g).

Table 23 - Summary of results obtained by the RHAPSODY Agar alternative method and the ISO XP/TS 11059 reference method (CFU/g)

Laboratories	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	1300	1700	1300	1300	8100	12000	10000	11000	110000	100000	130000	120000
B	<10	<10	<10	<10	910	750	850	850	1900	1600	2100	910	6300	13000	15000	10000
C	<10	<10	<10	<10	1300	1700	2000	1600	11000	9500	12000	11000	120000	120000	140000	150000
D	<10	<10	<10	<10	1100	1200	1400	1500	9200	9600	13000	12000	110000	180000	140000	190000
E	<10	<10	<10	<10	1300	1200	930	1200	7500	7200	8200	7500	75000	110000	85000	88000
F	<10	<10	<10	<10	1200	960	1500	670	8000	9100	6800	6500	69000	110000	85000	74000
G	<10	<10	<10	<10	1300	1100	1400	1200	7300	14000	7400	11000	90000	90000	140000	81000
I	<10	<10	<10	<10	1300	1300	1600	1500	6100	12000	7800	11000	110000	110000	100000	130000
J	<10	<10	<10	<10	1500	1200	1300	1700	10000	6700	9600	8500	110000	80000	76000	85000
K	<10	<10	<10	<10	570	520	670	680	6500	4400	7500	7100	65000	64000	88000	140000
M	<10	<10	<10	<10	1200	1100	1500	2000	11000	11000	10000	12000	140000	240000	150000	180000
N	<10	<10	<10	<10	1400	1700	1800	1800	15000	13000	14000	22000	140000	98000	150000	140000
O	<10	<10	<10	<10	1200	1500	1200	1900	12000	12000	13000	13000	220000	130000	120000	130000
P	<10	<10	<10	<10	1200	1400	1400	1800	13000	13000	8000	11000	300000	140000	210000	130000

Table 24 - Summary of results obtained by the RHAPSODY Agar alternative method and the ISO XP/TS 11059 reference method (log CFU/g)

Laboratories	Level 0				Level 1				Level 2				Level 3			
	Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method		Reference method		Alternative method	
A	<1.00	<1.60	<1.00	<1.00	3.114	3.230	3.114	3.114	3.908	4.079	4.000	4.041	5.041	5.000	5.114	5.079
B	<1.00	<1.00	<1.00	<1.00	2.959	2.875	2.929	2.929	3.279	3.204	3.322	2.959	3.799	4.114	4.176	4.000
C	<1.00	<1.00	<1.00	<1.00	3.114	3.230	3.301	3.204	4.041	3.978	4.079	4.041	5.079	5.079	5.146	5.176
D	<1.00	<1.00	<1.00	<1.00	3.041	3.079	3.146	3.176	3.964	3.982	4.114	4.079	5.041	5.255	5.146	5.279
E	<1.00	<1.00	<1.00	<1.00	3.114	3.079	2.968	3.079	3.875	3.857	3.914	3.875	4.875	5.041	4.929	4.944
F	<1.00	<1.00	<1.00	<1.00	3.079	2.982	3.176	2.826	3.903	3.959	3.833	3.813	4.839	5.041	4.929	4.869
G	<1.00	<1.00	<1.00	<1.00	3.114	3.041	3.146	3.079	3.863	4.146	3.869	4.041	4.954	4.954	5.146	4.908
I	<1.00	<1.00	<1.00	<1.00	3.114	3.114	3.204	3.176	3.785	4.079	3.892	4.041	5.041	5.041	5.000	5.114
J	<1.00	<1.00	<1.00	<1.00	3.176	3.079	3.114	3.230	4.000	3.826	3.982	3.929	5.041	4.903	4.881	4.929
K	<1.00	<1.00	<1.00	<1.00	2.756	2.716	2.826	2.833	3.813	3.643	3.875	3.851	4.813	4.806	4.944	5.146
M	<1.00	<1.00	<1.00	<1.00	3.079	3.041	3.176	3.301	4.041	4.041	4.000	4.079	5.146	5.380	5.176	5.255
N	<1.00	<1.00	<1.00	<1.00	3.146	3.230	3.255	3.255	4.176	4.114	4.146	4.342	5.146	4.991	5.176	5.146
O	<1.00	<1.00	<1.00	<1.00	3.079	3.176	3.079	3.279	4.079	4.079	4.114	4.114	5.342	5.114	5.079	5.114
P	<1.00	<1.00	<1.00	<1.00	3.079	3.146	3.146	3.255	4.114	4.114	3.903	4.041	5.477	5.146	5.322	5.114



Measurement result consistency check

Consistency plots were applied to identify any inconsistent results relative to the whole: these are robust Mandel h (inter-laboratory consistency) and k (intra-laboratory consistency) statistics.

The plots obtained for the reference method and alternative method are given in **Appendix 14** . The number of values below the h and k thresholds is given in the table below:

Table 25

Mandel values	Number of below-threshold values observed			
	Reference method ISO XP/TS 11059		Alternative method RHAPSODY Agar	
h > 1%	Lab B	Levels 1, 2 and 3	Lab B	Levels 2 and 3
	Lab K	Level 1		
h > 5 %	Lab B	Levels 1, 2 and 3	Lab B	Levels 1, 2 and 3
	Lab K	Levels 1 and 2	Lab K	Level 1
k > 1%	/		Lab B	Level 2
k > 5%	Lab G	Level 2	Lab B	Level 2
	Lab I	Level 2	Lab G	Level 3

After close examination of the values, it did not seem justified to exclude a laboratory.



Biais

In order to estimate the bias of the alternative method relative to the reference method for each level, D_{ij} and t were calculated using the following equations:

$$D_{ij} = \bar{Y}_{ij, Alt} - \bar{Y}_{ij, Ref}$$

$$t = \frac{|\text{median } i(D_{ij})|}{\sqrt{\pi / (2 p) \phi \text{ Diff}}}$$

If the value of t is greater than 2, the alternative method is significantly biased relative to the reference method.

Table 26 - Values of t(d) obtained per level

Level	Biais D	t(d)	Conclusion
1	0.059	2.46	Significant bias
2	0.031	0.91	Non-significant bias
3	0.040	1.23	Non-significant bias

Bias is significant at level 1, but with a low value of 0.059 log CFU/g. It is non-significant for the other two levels.



Comparison of accuracy and reliability characteristics of the reference method and alternative method

Statistical calculations are given in **Appendix 15**. An overview of the results obtained is given in the table below.

Table 27

Level	ISO XP/TS 11059 reference method			RHAPSODY Agar alternative method		
	Median	Repeatability standard deviation	Repeatability standard deviation	Median	Repeatability standard deviation	Repeatability standard deviation
1	3.105	0.254	0.254	3.167	0.151	0.172
2	3.983	0.086	0.141	3.969	0.081	0.147
3	5.031	0.162	0.219	5.077	0.090	0.170



Comparison of repeatability standard deviations

If the ratio of repeatability standard deviations of the alternative method to those of the reference method is greater than 2, the reliability under conditions of repeatability of the alternative method is considered inferior to that of the reference method. If this ratio is greater than 0.5, the reliability of the alternative method is considered to be superior to that of the reference method.

The values of these ratios are given in the table below.

Table 28 - Repeatability standard deviation ratios

Level of contamination	4 ISO XP/TS 11059 reference method		Alternative method RHAPSODY Agar		Ratio Sr Alt. / Sr Ref.
	Sr Ref.	r Ref.	Sr Alt.	r Alt.	
1	0.254	0.711	0.151	0.423	0.595
2	0.086	0.241	0.081	0.226	0.939
3	0.162	0.454	0.090	0.223	0.558

The ratios of the repeatability standard deviations are all less than 2; **the reliability under conditions of repeatability of the alternative method is considered to be equivalent to that of the reference method.**



Comparison of reproducibility standard deviations

If the ratio of reproducibility standard deviations of the alternative method to those of the reference method is greater than 2, the reliability under conditions of reproducibility of the alternative method is considered inferior to that of the reference method. If this ratio is greater than 0.5, the reliability of the alternative method is considered to be superior to that of the reference method.

The values of these ratios are given in the table below.

Table 29 - Reproducibility standard deviation ratios

Level of contamination	ISO XP/TS 11059 reference method		Alternative method RHAPSODY Agar		Ratio SR Alt/SR Ref.
	SR Ref.	R Ref.	SR Alt.	R Alt.	
1	0.254	0.711	0.172	0.483	0.679
2	0.141	0.394	0.147	0.413	1.049
2	0.219	0.614	0.170	0.477	0.777

The ratios of the reproducibility standard deviations are all less than 2; **the reliability under conditions of reproducibility of the alternative method is considered to be equivalent to that of the reference method.**

5 CONCLUSION

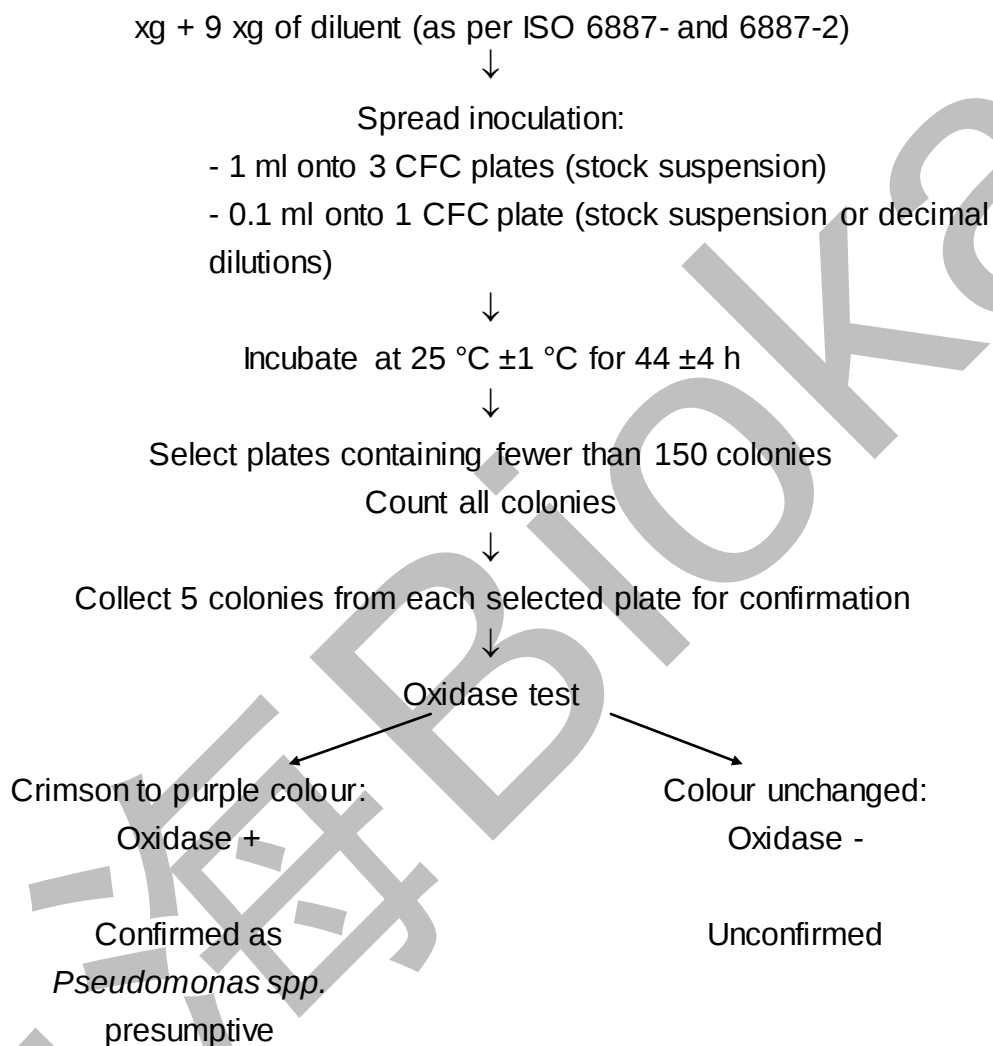
The conclusions of the method comparative study are as follows:

- ☑ The RHAPSODY Agar® method gave satisfactory linearity and accuracy results, using both the spread technique and the Spiral technique.
- ☑ By comparison to the performances of the reference methods, the RHAPSODY Agar® method is specific and selective. It enables better recovery of stressed *Pseudomonas* spp. cells.
- ☑ The RHAPSODY Agar® method does not require confirmation tests and results are available at D2 versus D4 for the reference method.

The conclusions of the inter-laboratory study are as follows:

- ☑ Bias was non-significant relative to the reference method NF EN ISO 13720 for the three levels.
- ☑ Bias was significant for level 1 compared to reference method ISO XP/TS 11059, though with a very low and perfectly acceptable value of 0.059 log CFU/g.
- ☑ Reliability of the RHAPSODY Agar® alternative method under conditions of repeatability was equivalent to that of the two reference methods (NF EN ISO 13720 and ISO XP/TS 11059).
- ☑ Reliability of the RHAPSODY Agar® alternative method under conditions of reproducibility was equivalent to that of the two reference methods (NF EN ISO 13720 and ISO XP/TS 11059).

Appendix 1 - NF EN ISO 13720 reference method (November 2010):
Meat and meat-based products.
Enumeration of presumed *Pseudomonas* spp.



Appendix 2 - XP ISO/TS 11059 reference method (October 2009):
Milk and dairy products.
Method for the enumeration of *Pseudomonas* spp.

xg + 9 xg of diluent (as per ISO 6887-5)



Spread inoculation:

- 1 ml onto 3 PPA plates (penicillin and pimaricin agar) (stock suspension)
- 0.1 ml onto 1 PPA plate (stock suspension or decimal dilutions)



Incubate at 25 °C ±1 °C for 48 ±4 h



Select plates containing fewer than 150 colonies

Count all colonies



Collect 5 colonies from each selected plate for confirmation

Isolate on nutrient agar



Incubate at 25 °C ±1 °C for 24 to 48 h

Oxidase test

Crimson to purple
colour:
Oxidase +

Colour unchanged:
Oxidase -

Stab-inoculate
a glucose agar tube



Incubate at 25 °C ±1 °C for 24 ±3 h

Yellow tube:
Test +

Crimson tube
Test -

Pseudomonas spp.:

Oxidase +
BCP glucose -

Appendix 3 - RHAPSODY Agar® alternative method protocol

xg + 9 xg of diluent
(as per ISO 6887-1, ISO 6887-2 and ISO 6887-5)

↓
Spread enumeration

1 ml onto 3 Rhapsody
plates
(stock suspension)

0.1 ml onto 1 Rhapsody
plate
(stock suspension and
decimal dilutions)

↓
Spiral enumeration

50 µl of stock solution or
decimal dilution onto
Rhapsody plates

↓
Incubate at 30 °C ±1 °C for 48 ±3 h to 72 h

↓
Read the plates manually at 45 and 72 h

↓
Spread techniques: Select those plates
containing less than 150 colonies

Spiral technique: See the Spiral technique reading protocol

↓
Count the characteristic colonies (pale blue to blue-green colonies)*

*: In the context of the validation study, the oxidase and BCP glucose tests were performed on one typical colony per selected plate

Appendix 4 - Linearity study: raw results

Matrix	Strain	Inoculation rate	No. Spl.	Reference method				Alternative method: RHAPSODY																		
				ISO 13720*				Spread method - 45 h				Spread method - 72 h				Spiral method - 45 h					Spiral method - 72 h					
				Dilution	CFU/plate	CFU/g	log CFU/g	Dilution	CFU/plate	CFU/g	Log CFU/g	Dilution	CFU/plate	CFU/g	Log CFU/g	Dilution	Reading zone	CFU/plate	CFU/g	Log CFU/g	Dilution	Reading zone	CFU/plate	CFU/g	log CFU/g	
Duck mousse Batch 44302 Total flora: 13000 CFU/g	Pseudomonas putida 4	300	4793	10	15	150	2.18	10	7	70	1.85	10	17	210	2.32	/	/	/	/	/	/	/	/	/		
				100	1			100	3			100	6			/	/	/	/	/	/	/	/	/		
			4794	10	32	330	2.52	10	11	140	2.15	10	23	260	2.41	/	/	/	/	/	/	/	/	/		
				100	4			100	4			100	5			/	/	/	/	/	/	/	/	/		
			4795	10	23	240	2.38	10	13	120	2.08	10	27	250	2.40	/	/	/	/	/	/	/	/	/		
				100	3			100	0			100	0			/	/	/	/	/	/	/	/	/		
			4796	10	23	230	2.36	10	13	150	2.18	10	25	260	2.41	/	/	/	/	/	/	/	/	/		
				100	2			100	3			100	3			/	/	/	/	/	/	/	/	/		
			4797	10	49	480	2.68	10	20	190	2.28	10	33	310	2.49	/	/	/	/	/	/	/	/	/		
				100	4			100	1			100	1			/	/	/	/	/	/	/	/	/		
			6000	4798	100	38	3900	3.59	100	45	4400	3.64	100	52	5000	3.70	10	st	21	4200	3.62	10	st	21	4200	3.62
					1000	5			1000	3			1000	3												
		4799		100	48	4600	3.66	100	45	4400	3.64	100	46	4500	3.65	10	st	29	5800	3.76	10	st	29	5800	3.76	
				1000	3			1000	3			1000	4													
		4800		100	68	6500	3.81	100	32	3300	3.52	100	45	4500	3.65	10	st	24	4800	3.68	10	st	24	4800	3.68	
				1000	3			1000	4			1000	5													
		4801		100	80	7600	3.88	100	44	4100	3.61	100	52	4800	3.68	10	st	29	5800	3.76	10	st	29	5800	3.76	
				1000	4			1000	1			1000	1													
		4802		100	56	5200	3.72	100	42	4200	3.62	100	48	4700	3.67	10	st	22	4000	3.60	10	st	22	4000	3.60	
				1000	1			1000	4			1000	4													
		60000		4803	1000	55	51000	4.71	1000	36	35000	4.54	1000	38	36000	4.56	/	/	/	/	/	/	/	/	/	/
					10000	1			10000	2			10000	2			/	/	/	/	/	/	/	/	/	
			4804	1000	57	56000	4.75	1000	53	49000	4.69	1000	57	53000	4.72	/	/	/	/	/	/	/	/	/		
				10000	5			10000	1			10000	1			/	/	/	/	/	/	/	/	/		
			4805	1000	42	41000	4.61	1000	46	45000	4.65	1000	47	45000	4.65	/	/	/	/	/	/	/	/	/		
				10000	3			10000	3			10000	3			/	/	/	/	/	/	/	/	/		
			4806	1000	20	21000	4.32	1000	46	47000	4.67	1000	46	47000	4.67	/	/	/	/	/	/	/	/	/		
				10000	3			10000	6			10000	6			/	/	/	/	/	/	/	/	/		
			4807	1000	39	37000	4.57	1000	43	46000	4.66	1000	48	51000	4.71	/	/	/	/	/	/	/	/	/		
				10000	2			10000	8			10000	8			/	/	/	/	/	/	/	/	/		
		100000	4808	1000	123	120000	5.08	1000	/	/	/	1000	/	/	/	10	3	54	110000	5.04	10	3	54	110000	5.04	
				10000	6			10000	/			10000	/													
			4809	1000	77	81000	4.91	1000	/	/	/	1000	/	/	/	10	3	45	87000	4.94	10	3	45	87000	4.94	
				10000	12			10000	/			10000	/													
			4810	1000	56	55000	4.74	1000	/	/	/	1000	/	/	/	10	3	91	100000	5.00	10	3	91	100000	5.00	
				10000	4			10000	/			10000	/													
			4811	1000	60	62000	4.79	1000	/	/	/	1000	/	/	/	10	3	64	71000	4.85	10	3	64	71000	4.85	
				10000	8			10000	/			10000	/													
			4812	1000	67	66000	4.82	1000	/	/	/	1000	/	/	/	10	3	75	150000	5.18	10	3	75	150000	5.18	
				10000	6			10000	/			10000	/													
		600000	4813	10000	53	530000	5.72	10000	/	/	/	10000	/	/	/	100	4	65	710000	5.85	100	4	65	710000	5.85	
				100000	5			100000	/			100000	/													
			4814	10000	71	720000	5.86	10000	/	/	/	10000	/	/	/	100	4	46	910000	5.96	100	4	46	910000	5.96	
				100000	8			100000	/			100000	/													
			4815	10000	69	710000	5.85	10000	/	/	/	10000	/	/	/	100	4	53	580000	5.76	100	4	53	580000	5.76	
				100000	9			100000	/			100000	/													
			4816	10000	57	610000	5.79	10000	/	/	/	10000	/	/	/	100	4	71	780000	5.89	100	4	71	780000	5.89	
				100000	10			100000	/			100000	/													
		4817	10000	69	690000	5.84	10000	/	/	/	10000	/	/	/	100	4	64	710000	5.85	100	4	64	710000	5.85		

* Test conducted under accreditation

Matrix	Strain	Inoculation rate	No. Spl.	Reference method ISO 13720*				Alternative method: RHAPSODY																	
								Spread method - 45 h				Spread method - 72 h				Spiral method - 45 h					Spiral method - 72 h				
				Dilution	CFU/ plate	CFU/g	log CFU/g	Dilution	CFU/plate	CFU/g	Log CFU/g	Dilution	CFU/plate	CFU/g	Log CFU/g	Dilution	Reading zone	CFU/ plate	CFU/g	Log CFU/g	Dilution	Reading zone	CFU/plate	CFU/g	log CFU/g
Duck mousse Batch 45720 Total flora: 2600 CFU/g	Pseudomonas putida 4	300	4818	100000	7			100000	/			100000	/					/	/	/	/	/	/	/	/
				10	26	260	2.41	10	18	190	2.28	10	26	260	2.41	/	/	/	/	/	/	/	/	/	/
			4819	100	2			100	3			100	3			/	/	/	/	/	/	/	/	/	/
				10	25	260	2.41	10	22	230	2.36	10	22	230	2.36	/	/	/	/	/	/	/	/	/	/
			4820	100	3			100	3			100	3			/	/	/	/	/	/	/	/	/	/
				10	28	260	2.41	10	15	150	2.18	10	18	170	2.23	/	/	/	/	/	/	/	/	/	/
			4821	100	0			100	1			100	1			/	/	/	/	/	/	/	/	/	/
				10	23	210	2.32	10	21	200	2.30	10	21	200	2.30	/	/	/	/	/	/	/	/	/	/
			4822	100	0			100	1			100	1			/	/	/	/	/	/	/	/	/	/
				10	16	160	2.20	10	14	150	2.18	10	16	160	2.20	/	/	/	/	/	/	/	/	/	/
			6000	100	1			100	2			100	2			/	/	/	/	/	/	/	/	/	/
			4823	100	68	6500	3.81	100	83	8000	3.90	100	86	8300	3.92	10	st	27	5400	3.73	10	st	27	5400	3.73
				1000	4			1000	5			1000	5												
			4824	100	66	6400	3.81	100	44	4500	3.65	100	44	4500	3.65	10	st	20	4000	3.60	10	st	20	4000	3.60
				1000	4			1000	5			1000	5												
			4825	100	51	5300	3.72	100	42	4300	3.63	100	43	4400	3.64	10	st	25	5000	3.70	10	st	25	5000	3.70
				1000	7			1000	5			1000	5												
			4826	100	73	7300	3.86	100	54	5300	3.72	100	57	5500	3.74	10	st	24	4800	3.68	10	st	24	4800	3.68
				1000	7			1000	4			1000	4												
			4827	100	69	6700	3.83	100	20	2500	3.40	100	20	2500	3.40	10	st	29	5800	3.76	10	st	29	5800	3.76
				1000	5			1000	7			1000	7												
		60000	4828	1000	69	68000	4.83	1000	39	39000	4.59	1000	39	39000	4.59	/	/	/	/	/	/	/	/	/	/
				10000	6			10000	4			10000	4			/	/	/	/	/	/	/	/	/	/
			4829	1000	44	43000	4.63	1000	61	59000	4.77	1000	63	61000	4.79	/	/	/	/	/	/	/	/	/	/
				10000	3			10000	4			10000	4			/	/	/	/	/	/	/	/	/	/
			4830	1000	67	65000	4.81	1000	30	32000	4.51	1000	30	32000	4.51	/	/	/	/	/	/	/	/	/	/
				10000	5			10000	5			10000	5			/	/	/	/	/	/	/	/	/	/
			4831	1000	43	43000	4.63	1000	29	29000	4.46	1000	31	31000	4.49	/	/	/	/	/	/	/	/	/	/
				10000	4			10000	3			10000	3			/	/	/	/	/	/	/	/	/	/
			4832	1000	54	55000	4.74	1000	43	45000	4.65	1000	47	49000	4.69	/	/	/	/	/	/	/	/	/	/
				10000	6			10000	7			10000	7			/	/	/	/	/	/	/	/	/	/
		100000	4833	1000	81	86000	4.93	1000	/	/	/	1000	/	/	/	10	3	64	130000	5.11	10	3	64	130000	5.11
				10000	14			10000	/	/	/	10000	/	/	/										
			4834	1000	73	76000	4.88	1000	/	/	/	1000	/	/	/	10	3	56	110000	5.04	10	3	56	110000	5.04
				10000	11			10000	/	/	/	10000	/	/	/										
			4835	1000	105	100000	5.00	1000	/	/	/	1000	/	/	/	10	3	51	99000	5.00	10	3	51	99000	5.00
				10000	5			10000	/	/	/	10000	/	/	/										
			4836	1000	77	74000	4.87	1000	/	/	/	1000	/	/	/	10	3	54	110000	5.04	10	3	54	110000	5.04
				10000	4			10000	/	/	/	10000	/	/	/										
			4837	1000	120	120000	5.08	1000	/	/	/	1000	/	/	/	10	3	56	110000	5.04	10	3	56	110000	5.04
				10000	7			10000	/	/	/	10000	/	/	/										
		600000	4838	10000	58	550000	5.74	10000	/	/	/	10000	/	/	/	100	4	49	540000	5.73	100	4	49	540000	5.73
				100000	3			100000	/	/	/	100000	/	/	/										
			4839	10000	29	320000	5.51	10000	/	/	/	10000	/	/	/	100	4	49	540000	5.73	100	4	49	540000	5.73
				100000	6			100000	/	/	/	100000	/	/	/										
			4840	10000	42	420000	5.62	10000	/	/	/	10000	/	/	/	100	4	71	470000	5.67	100	4	71	470000	5.67
				100000	4			100000	/	/	/	100000	/	/	/										
			4841	10000	32	320000	5.51	10000	/	/	/	10000	/	/	/	100	4	65	430000	5.63	100	4	65	430000	5.63
				100000	3			100000	/	/	/	100000	/	/	/										
			4842	10000	29	300000	5.48	10000	/	/	/	10000	/	/	/	100	4	70	460000	5.66	100	4	70	460000	5.66
				100000	4			100000	/	/	/	100000	/	/	/										

Matrix	Strain	Inoculation rate	No. Spl.	XP ISO/TS 11059 reference method*				Alternative method: RHAPSODY								
								Spreading method				Spiral method				
				Dilution	CFU/plate	CFU/g	log CFU/g	Dilution	CFU/plate	CFU/g	log CFU/g	Dilution	Reading zone	CFU/plate	CFU/g	log CFU/g
Vanilla cream dessert Batch 25/15 Total flora: <10 CFU/g	Pseudomonas jesenii Ad1143	300	4729	10	40	360	2.56	10	36	370	2.57	/	/	/	/	/
				100	0			100	5			/	/	/	/	/
			4730	10	36	360	2.56	10	30	300	2.48	/	/	/	/	/
				100	4			100	3			/	/	/	/	/
			4731	10	33	330	2.52	10	24	290	2.46	/	/	/	/	/
				100	3			100	8			/	/	/	/	/
			4732	10	31	290	2.46	10	40	390	2.59	/	/	/	/	/
				100	1			100	3			/	/	/	/	/
			4733	10	49	480	2.68	10	40	400	2.60	/	/	/	/	/
				100	4			100	4			/	/	/	/	/
		6000	4734	100	72	7200	3.86	100	82	8000	3.90	10	st	38	7600	3.88
				1000	7			1000	6							
			4735	100	73	7400	3.87	100	73	7200	3.86	10	st	30	6000	3.78
				1000	8			1000	6							
			4736	100	74	7600	3.88	100	82	8000	3.90	10	st	35	7000	3.85
				1000	10			1000	6							
			4737	100	94	9300	3.97	100	80	7700	3.89	10	st	45	9000	3.95
				1000	8			1000	5							
			4738	100	81	7900	3.90	100	75	7300	3.86	10	st	45	9000	3.95
				1000	6			1000	5							
		60000	4739	1000	44	45000	4.65	1000	68	70000	4.85	/	/	/	/	/
				10000	6			10000	9			/	/	/	/	/
			4740	1000	64	63000	4.80	1000	81	81000	4.91	/	/	/	/	/
				10000	5			10000	8			/	/	/	/	/
			4741	1000	70	67000	4.83	1000	56	59000	4.77	/	/	/	/	/
				10000	4			10000	9			/	/	/	/	/
			4742	1000	55	55000	4.74	1000	84	85000	4.93	/	/	/	/	/
				10000	5			10000	9			/	/	/	/	/
			4743	1000	76	74000	4.87	1000	78	82000	4.91	/	/	/	/	/
				10000	5			10000	12			/	/	/	/	/
		100000	4744	1000	122	120000	5.08	1000	/	/	/	10	3	62	120000	5.08
				10000	15			10000	/							
			4745	1000	130	130000	5.11	1000	/	/	/	10	3	74	150000	5.18
				10000	10			10000	/							
			4746	1000	130	120000	5.08	1000	/	/	/	10	3	67	130000	5.11
				10000	7			10000	/							
			4747	1000	129	130000	5.11	1000	/	/	/	10	3	65	130000	5.11
				10000	14			10000	/							
			4748	1000	140	140000	5.15	1000	/	/	/	10	3	62	120000	5.08
				10000	13			10000	/							
		600000	4749	10000	79	720000	5.86	10000	/	/	/	100	4	67	740000	5.87
				100000	1			100000	/							
			4750	10000	60	630000	5.80	10000	/	/	/	100	4	66	730000	5.86
				100000	9			100000	/							
			4751	10000	69	700000	5.85	10000	/	/	/	100	4	67	740000	5.87
				100000	8			100000	/							
			4752	10000	55	540000	5.73	10000	/	/	/	100	4	58	640000	5.81
				100000	4			100000	/							
			4753	10000	81	840000	5.92	10000	/	/	/	100	4	64	710000	5.85

* Test conducted under accreditation

Matrix	Strain	Inoculation rate	No. Spl.	XP ISO/TS 11059 reference method *				Alternative method: RHAPSODY								
								Spreading method				Spiral method				
				Dilution	CFU/plate	CFU/g	log CFU/g	Dilution	CFU/plate	CFU/g	log CFU/g	Dilution	Reading zone	CFU/plate	CFU/g	log CFU/g
				100000	11			100000	/							
Vanilla cream dessert Batch 07/01 Total flora: <10 CFU/g	Pseudomonas jesenii Ad1143	300	4754	10	51	500	2.70	10	39	410	2.61	/	/	/	/	/
				100	4			100	6			/	/	/	/	/
			4755	10	34	330	2.52	10	38	360	2.56	/	/	/	/	/
				100	2			100	2			/	/	/	/	/
			4756	10	39	370	2.57	10	48	460	2.66	/	/	/	/	/
				100	2			100	2			/	/	/	/	/
			4757	10	23	230	2.36	10	44	440	2.64	/	/	/	/	/
				100	2			100	4			/	/	/	/	/
		4758	10	38	380	2.58	10	43	440	2.64	/	/	/	/	/	
			100	4			100	5			/	/	/	/	/	
		6000	4759	100	61	6200	3.79	100	53	5500	3.74	10	st	30	6000	3.78
				1000	7			1000	8			10	st	39	7800	3.89
			4760	100	69	7000	3.85	100	85	8400	3.92	10	st	36	7200	3.86
				1000	8			1000	7			10	st	47	9400	3.97
			4761	100	77	7600	3.88	100	60	5800	3.76	10	st	45	9000	3.95
				1000	7			1000	4			10	st			
			4762	100	85	8500	3.93	100	76	7500	3.88	10	st			
				1000	9			1000	6			10	st			
		4763	100	84	8000	3.90	100	70	6800	3.83	10	st				
			1000	4			1000	5			10	st				
		60000	4764	1000	76	73000	4.86	1000	66	67000	4.83	/	/	/	/	/
				10000	4			10000	8			/	/	/	/	/
			4765	1000	65	63000	4.80	1000	110	100000	5.00	/	/	/	/	/
				10000	4			10000	3			/	/	/	/	/
			4766	1000	83	83000	4.92	1000	71	70000	4.85	/	/	/	/	/
				10000	8			10000	6			/	/	/	/	/
			4767	1000	88	83000	4.92	1000	66	63000	4.80	/	/	/	/	/
				10000	3			10000	3			/	/	/	/	/
		4768	1000	73	70000	4.85	1000	74	76000	4.88	/	/	/	/	/	
			10000	4			10000	10			/	/	/	/	/	
		100000	4769	1000	152	150000	5.18	1000	/	/	/	10	3	57	110000	5.04
				10000	17			10000	/			10	3	66	130000	5.11
			4770	1000	124	120000	5.08	1000	/	/	/	10	3	67	130000	5.11
				10000	11			10000	/			10	3	74	150000	5.18
			4771	1000	101	110000	5.04	1000	/	/	/	10	3	72	140000	5.15
				10000	15			10000	/			100	4	61	680000	5.83
			4772	1000	111	110000	5.04	1000	/	/	/	100	4	54	600000	5.78
				10000	13			10000	/			100	4	57	630000	5.80
		4773	1000	90	87000	4.94	1000	/	/	/	100	4	59	660000	5.82	
			10000	6			10000	/			100	4	63	700000	5.85	
		600000	4774	10000	78	770000	5.89	10000	/	/	/	100	4			
				100000	7			100000	/			100	4			
			4775	10000	65	670000	5.83	10000	/	/	/	100	4			
				100000	9			100000	/			100	4			
			4776	10000	74	740000	5.87	10000	/	/	/	100	4			
				100000	7			100000	/			100	4			
			4777	10000	85	840000	5.92	10000	/	/	/	100	4			
				100000	7			100000	/			100	4			
		4778	10000	83	800000	5.90	10000	/	/	/	100	4				
			100000	5			100000	/								

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Appendix 5 - Artificial contamination

Spl. no.	Product	Artificial inoculations	Origin	Stress applied	Stress evaluation
4451	Crème fraîche egg portion	<i>Pseudomonas aeruginosa</i> 20	Raw milk	TT 5 min. 56 °C	1.05
4452	Butter made with pasteurised milk	<i>Pseudomonas aeruginosa</i> 20	Raw milk	TT 5 min. 56 °C	1.05
4453	Mozzarella	<i>Pseudomonas aeruginosa</i> 20	Raw milk	TT 5 min. 56 °C	1.05
4454	Mozzarella	<i>Pseudomonas aeruginosa</i> 20	Raw milk	TT 5 min. 56 °C	1.05
4555	Salted butter made with raw milk	<i>Pseudomonas aeruginosa</i> 20	Raw milk	TT 5 min 56 °C / 5 days at 4 °C	1.76
4556	Salted butter made with raw milk	<i>Pseudomonas</i> spp Ad1522	Dairy product	TT 5 min 56 °C / 5 days at 4 °C	0.92
4557	Mozzarella	<i>Pseudomonas aeruginosa</i> 20	Raw milk	TT 5 min 56 °C / 5 days at 4 °C	1.76
4558	Mozzarella	<i>Pseudomonas</i> spp Ad1522	Dairy product	TT 5 min 56 °C / 5 days at 4 °C	0.92
4559	Pasteurised milk (semi-skimmed)	<i>Pseudomonas aeruginosa</i> 20	Raw milk	TT 5 min 56 °C / 5 days at 4 °C	1.76
4560	Pasteurised whole milk	<i>Pseudomonas</i> spp Ad1522	Dairy product	TT 5 min 56 °C / 5 days at 4 °C	0.92
4561	Goat's cheese made with pasteurised milk	<i>Pseudomonas</i> spp Ad1522	Dairy product	TT 5 min 56 °C / 5 days at 4 °C	0.92

Appendix 6 - Accuracy study: raw results

(): 72 h reading result

MEAT PRODUCTS																									
Spl. no.	Product	ISO 13720 reference method *										RHAPSODY alternative method - Spread													
		Dilution	Before confirmation		After confirmation				log CFU/g ISO		Dilution	45 h reading						72 h reading							
			CFU/plate		CFU/plate		CFU/g	CFU/g				CFU/plate (45 h)		Confirmation (oxidase) Rep1/Rep2	CFU/g		log CFU/g Spr. 45 h		CFU/plate		CFU/g		log CFU/g Spr. 72h		
			Rep1	Rep2	Rep1	Rep2	Rep2	Rep1	Rep2	Rep 1		Rep2	Rep1		Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2
3938	Plan lardoons	10	0	0	0	0	<10	<10	<10	<1.00	<1.00	10	1	0	+/	<40	<10	<1.60	<1.00	1	0	<40	<10	<1.60	<1.00
		100	0	0	0	0						100	0	0	/			Detection		0	0			Detection	
3939	Chipolatas	10000	67	47	67	47	463636	640000	460000	5.81	5.66	10000	32	36	+/+	330000	350000	5.52	5.54	32	39	330000	380000	5.52	5.58
		100000	3	4	3	4						100000	4	3	+/+					4	3				
3940	Pork chop	10000	>150	>150	/	/	2400000	3400000	2400000	6.53	6.38	10000	109	95	+/+	1100000	950000	6.04	5.98	134	113	1400000	1100000	6.15	6.04
		100000	34	24	34	24				N'	N'	100000	14	9	+/+					17	11				
3941	Turkey cutlet	10000	27	31	27	31	300000	290000	300000	5.46	5.48	10000	24	19	+/+	250000	190000	5.40	5.28	28	26	310000	260000	5.49	5.41
		100000	5	2	5	2						100000	3	2	+/+					6	3				
3942	Rump steak	10000	>150	>150	/	/	3000000	2300000	3000000	6.36	6.48	10000	>150	>150	/	2000000	1800000	6.30	6.26	>150	>150	2500000	2500000	6.40	6.40
		100000	23	30	23	30				N'	N'	100000	20	18	+/+			N'	N'	25	25			N'	N'
4066	Slice of leg of lamb	1000	7	4	5	4	4000	7000	4000	3.85	3.60	1000	8	11	+/+	7300	10000	3.86	4.00	8	11	7300	10000	3.86	4.00
		10000	1	0	1	0				Ne	Ne	10000	0	0	/					0	0				
4067	Salted pork belly	10	34	25	34	15	145	320	150	2.51	2.18	10	0	0	+/+(72h)	<10	<10	<1.00	<1.00	11	11	120	100	2.08	2.00
		100	6	6	1	1						100	0	0	/					2	0				
4068	Muzzle pâté with parsley	10	27	29	27	29	300	290	300	2.46	2.48	10	12	17	+/+	110	160	2.04	2.20	14	17	130	170	2.11	2.23
		100	5	4	5	4						100	0	0	/					0	2				
4069	Pork muzzle with tongue	100	73	84	0	0	<100	<100	<100	<2.00	<2.00	10	0	0	/	<10	<10	<1.00	<1.00	0	0	<10	<10	<1.00	<1.00
		1000	9	4	0	0						100	0	0	/					0	0				
4070	Cooked ham	10	1	3	1	3	<40	<40	<40	<1.60	<1.60	10	4	5	+/+	40	50	1.60	1.70	4	5	40	50	1.60	1.70
		100	0	0	0	0				Detection	Detection	100	1	0	+/			Ne	Ne	1	0			Ne	Ne
4244	Salami	10	0	1	0	1	<40	<10	<40	<1.00	<1.60	10	1	0	+/	<40	<10	<1.60	<1.00	2	0	<40	<10	<1.60	<1.00
		100	0	0	0	0					Detection	100	0	0	/			Detection		0	0			Detection	
4245	Dried sausage	10	5	0	5	0	<10	50	<10	1.70	<1.00	10	0	0	/	<10	<10	<1.00	<1.00	0	1	<10	<10	<1.00	<1.00
		100	0	0	0	0				Ne		100	0	0	/					0	0				
4246	Rolled pork belly	1000	103	94	103	94	90909	100000	91000	5.00	4.96	1000	72	84	+/+	73000	84000	4.86	4.92	84	88	85000	89000	4.93	4.95
		10000	10	6	10	6						10000	8	8	+/+					9	10				
4247	Raw chicken thigh	1000	48	54	48	54	55455	46000	55000	4.66	4.74	1000	90	63	+/+	85000	62000	4.93	4.79	94	68	91000	66000	4.96	4.82
		10000	3	7	3	7						10000	3	5	+/+					6	5				
4248	Quail	100000	3	1	3	1	<400000	<400000	<400000	<5.60	<5.60	100000	2	2	+/+	<400000	<400000	<5.60	<5.60	2	2	<400000	<400000	<5.60	<5.60
		1000000	0	0	0	0				Detection	Detection	1000000	0	0	/			Detection	Detection	0	0				
4439	Frozen minced steak	10	42	58	42	58	555	420	560	2.62	2.75	10	18	38	+/+	190	380	2.28	2.58	32	43	330	440	2.52	2.64
		100	4	3	4	3						100	3	4	+/+					4	5				
4440	Frozen beef tournedos fillet	10	>450	>450	/	/	8100	7900	8100	3.90	3.91	10	266	299	+/+	2800	3100	3.45	3.49	345	439	3600	4500	3.56	3.65
		100	79	81	79	81						100	44	45	+/+					51	56				
4441	Frozen top sirloin steak	10	23	23	23	23	227	230	230	2.36	2.36	10	12	11	+/+	130	100	2.11	2.00	18	15	210	160	2.32	2.20
		100	2	2	2	2						100	2	0	+					5	2				
4442	Frozen veal cutlet	10	27	48	27	48	482	260	480	2.41	2.68	10	11	24	+/+	100	230	2.00	2.36	14	29	140	280	2.15	2.45
		100	2	5	2	5						100	0	1	/+					1	2				
4443	Frozen filet mignon	1000	48	47	48	47	46364	51000	46000	4.71	4.66	1000	22	28	+/+	20000	27000	4.30	4.43	48	37	45000	35000	4.65	4.54
		10000	8	4	8	4						10000	0	2	/+					1	2				
4444	Frozen turkey stir-fry	10	>450	>450	/	/	6600	4700	6600	3.67	3.82	10	>450	>450	/	4600	48000	3.66	4.68	>450	>450	4800	4900	3.68	3.69
		100	47	66	47	66						100	46	48	+/+			N'	N'	48	49			N'	N4
4445	Hen	10000	153	119	153	119	1236364	1500000	1200000	6.18	6.08	100000	17	122(-4)	+/+	1500000	1200000	6.18	6.08	18	143(-4)	1800000	1400000	6.26	6.15
		100000	13	17	13	17						1000000	0	9(-5)	/+					2	11(-5)				
4446	Duck thigh	100000	>150	>150	>150	>150	144000000	210000000	210000000	8.32	8.32	100000	>150	>150	/	170000000	140000000	8.23	8.15	>150	>150	190000000	150000000	8.28	8.18
		1000000	21 (-7)	144	208	144				N'	N'	10000000	17 (-7)	144	+/+			N'	N'	19(-7)	151			N'	N4
4447	Coppa	10	illegible (confluent colonies)		/	/	2000	3900	2000	3.59	3.30	10	92	91	+/+	920	990	2.96	3.00	113	103	1100	1100	3.04	3.04
		100	39	20	39	20				N'	N'	100	9	18	+/+					9	18				
4448	Cooked ham	10	illegible (confluent colonies)		/	/	3400	4400	3400	3.64	3.53	10	>450	>450	/	3300	2900	3.52	3.46	>450	>450	3300	2900	3.52	3.46
		100	44	34	44	34				N'	N'	100	33	29	+/+			N'	N'	33	29			N'	N'
4449	Pâté	10	>450	>450	>450	>450	11600	12000	12000	4.08	4.08	10	>150	>450	/	7900	8000	3.90	3.90	>450	>450	8400	8500	3.92	3.93

♦ Test conducted under accreditation
ADRIA Développement
Summary report (Version 0) - RHAPSODY Agar

		100	118	116	118	116				N'	N'	100	79	80	+/+				N'	N'	84	85				N'	N'
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MEAT PRODUCTS																													
Spl. no.	Product	ISO 13720 reference method *										RHAPSODY alternative method - Spiral																	
		Dilution	Before confirmation		After confirmation				log CFU/g ISO		Dilution	Reading zone	45 h reading										72 h reading						
			CFU/plate		CFU/plate		CFU/g						CFU/g (rounded)		CFU/plate		Confirmation (ox;BCP) Rep1/Rep2		CFU/g		log CFU/g Sp. 45 h		CFU/plate		CFU/g		log CFU/g Sp. 72 h		
			Rep1	Rep2	Rep1	Rep2	Rep2	Rep1	Rep2	Rep1			Rep2	Rep1	Rep2	Rep1			Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2		
3938	Plan lardoons	10	0	0	0	0	<10	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	1	0	<800	<200	<2.90	<2.90	Detection	<2.90	<2.90
		100	0	0	0	0																							
3939	Chipolatas	10000	67	47	67	47	463636	640000	460000	5.81	5.66	10	2	75	76	+/+	300000	300000	5.48	5.48	84	79	330000	310000	5.52	5.52	5.52	5.52	5.52
		100000	3	4	3	4																							
3940	Pork chop	10000	>150	>150	/	/	2400000	3400000	2400000	6.53	6.38	1000	st	57	59	+/+	1100000	1200000	6.04	6.08	57	59	1100000	1200000	6.04	6.04	6.04	6.04	6.04
		100000	34	24	34	24				N'	N'																		
3941	Turkey cutlet	10000	27	31	27	31	300000	290000	300000	5.46	5.48	10	2	52	46	+/+	200000	180000	5.30	5.26	59	53	230000	210000	5.36	5.36	5.36	5.36	5.36
		100000	5	2	5	2																							
3942	Rump steak	10000	>150	>150	/	/	3000000	2300000	3000000	6.36	6.48	1000	st	136	143	+/+	2700000	2900000	6.43	6.46	138	144	2800000	2900000	6.45	6.45	6.45	6.45	6.45
		100000	23	30	23	30				N'	N'																		
4066	Slice of leg of lamb	1000	7	4	5	4	4000	7000	4000	3.85	3.60	10	st	30	29	+/+	6000	5800	3.78	3.76	30	33	6000	6600	3.78	3.78	3.78	3.78	3.78
		10000	1	0	1	0				Ne	Ne																		
4067	Salted pork belly	10	34	25	34	15	145	320	150	2.51	2.18	10	st	1	1	+/+	<800	<800	<2.90	<2.90	1	1	<800	<800	<2.90	<2.90	<2.90	<2.90	<2.90
		100	6	6	1	1										(200)	(200)	Detection(2.30)	Detection(2.30)			(200)	(200)	Detection(2.30)	Detection(2.30)	Detection(2.30)	Detection(2.30)	Detection(2.30)	
4068	Muzzle pâté with parsley	10	27	29	27	29	300	290	300	2.46	2.48	10	st	2	2	+/+	<800	<800	<2.90	<2.90	2	2	<800	<800	<2.90	<2.90	<2.90	<2.90	<2.90
		100	5	4	5	4										(400)	(400)	Detection(2.60)	Detection(2.60)			(400)	(400)	Detection(2.60)	Detection(2.60)	Detection(2.60)	Detection(2.60)	Detection(2.60)	
4069	Pork muzzle with tongue	100	73	84	0	0	<100	<100	<100	<2.00	<2.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200	<2.30	<2.30	<2.30	<2.30	<2.30
		1000	9	4	0	0																							
4070	Cooked ham	10	1	3	1	3	<40	<40	<40	<1.60	<1.60	10	st	0	0	/	<200	<200	<2.30	<2.30	1	0	<800	<200	<2.90	<2.90	<2.90	<2.90	<2.90
		100	0	0	0	0				Detection	Detection												(200)	<200	Detection(2.30)	Detection(2.30)	Detection(2.30)	Detection(2.30)	Detection(2.30)
4244	Salami	10	0	1	0	1	<40	<10	<40	<1.00	<1.60	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200	<2.30	<2.30	<2.30	<2.30	<2.30
		100	0	0	0	0				Detection	Detection																		
4245	Dried sausage	10	5	0	5	0	<10	50	<10	1.70	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200	<2.30	<2.30	<2.30	<2.30	<2.30
		100	0	0	0	0				Ne																			
4246	Rolled pork belly	1000	103	94	103	94	90909	100000	91000	5.00	4.96	10	3	70	43	+/+	140000	85000	5.15	4.93	63	44	120000	87000	5.08	5.08	5.08	5.08	5.08
		10000	10	6	10	6																							
4247	Raw chicken thigh	1000	48	54	48	54	55455	46000	55000	4.66	4.74	10	6	126	133	+/+	50000	53000	4.70	4.72	78	94	51000	62000	4.71	4.71	4.71	4.71	4.71
		10000	3	7	3	7														zone 5	zone 5								
4248	Quail	100000	3	1	3	1	<400000	<400000	<400000	<5.60	<5.60	100	st	34	24	+/+	48000	48000	4.68	4.68	34	25	68000	50000	4.83	4.83	4.83	4.83	4.83
		1000000	0	0	0	0				Detection	Detection																		
4439	Frozen minced steak	10	42	58	42	58	555	420	560	2.62	2.75	10	st	1	0	+/	<800	<200	<2.90	<2.30	2	0	<800	<200	<2.90	<2.90	<2.90	<2.90	<2.90
		100	4	3	4	3																							
4440	Frozen beef fillet tournedos	10	>450	>450	/	/	8100	7900	8100	3.90	3.91	10	st	16	21	+/+	3200	4200	3.51	3.62	20	25	4000	5000	3.60	3.60	3.60	3.60	3.60
		100	79	81	79	81																							
4441	Frozen top sirloin steak	10	23	23	23	23	227	230	230	2.36	2.36	10	st	1	0	+/	<800	<200	<2.90	<2.30	3	0	<800	<200	<2.90	<2.90	<2.90	<2.90	<2.90
		100	2	2	2	2														Detection(2.30)	Detection(2.30)					Detection	Detection	Detection	
4442	Frozen veal cutlet	10	27	48	27	48	482	260	480	2.41	2.68	10	st	1	0	+/	<800	<200	<2.90	<2.30	1	2	<800	<800	<2.90	<2.90	<2.90	<2.90	<2.90
		100	2	5	2	5														Detection(2.30)	Detection(2.30)					Detection	Detection	Detection	
4443	Frozen filet mignon	1000	48	47	48	47	46364	51000	46000	4.71	4.66	10	6	91	63	+/+	36000	25000	4.56	4.40	84	90	34000	36000	4.53	4.53	4.53	4.53	4.53
		10000	8	4	8	4																							
4444	Frozen turkey stir-fry	10	>450	>450	/	/	6600	4700	6600	3.																			

♦ Test conducted under accreditation
ADRIA Développement
Summary report (Version 0) - RHAPSODY Agar

DAIRY PRODUCTS																												
Spl. no.	Product	XP/ISO TS 11059 reference method*									RHAPSODY alternative method - Spread																	
		Dilution	Before confirmation		After confirmation				log CFU/g		Dilution	45 h reading								72 h reading								
			CFU/plate		CFU/plate		CFU/g					CFU/plate (45 h)		Confirm (ox;BCP) Rep1/Rep2	CFU/g		CFU/g (rounded)		log CFU/g		CFU/plate		CFU/g		CFU/g		log CFU/g	
			Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2		Rep1	Rep2		Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2
3943	Morbier made with raw milk	100	35	34	0	0	<100	<100	<2.00	<2.00	10	1	0	+/	<40	<10	<40	<10	<1.60 Detection	<1.00	1	0	<40	<10	<40	<10	<1.60 Detection	<1.00
		1000	3	3	0	0					100	0	0	/							0	0						
3944	Raw cream	10	0	0	0	0	<10	<10	<1.00	<1.00	10	0	0	/	<10	<10	<10	<10	<1.00	<1.00	0	0	<10	<10	<10	<10	<1.00	<1.00
		100	0	0	0	0					100	0	0	/							0	0						
3945	Mozzarella	10	0	0	0	0	<10	<10	<1.00	<1.00	10	0	0	/	<10	<10	<10	<10	<1.00	<1.00	0	0	<10	<10	<10	<10	<1.00	<1.00
		100	0	0	0	0					100	0	0	/							0	0						
3946	Semi-skimmed pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	10	0	0	/	<10	<10	<10	<10	<1.00	<1.00	0	0	<10	<10	<10	<10	<1.00	<1.00
		100	0	0	0	0					100	0	0	/							0	0						
3947	Raw milk	10000	27	33	27	33	250000	310000	5.40	5.49	10000	17	28	+/+	154545	254545	150000	250000	5.18	5.40	17	28	154545	254545	150000	250000	5.18	5.41
		100000	1	1	1	1					100000	0	0	/							0	0						
4071	Country style Saint Nectaire	1000	>150	>150	0	0	<1000	<1000	<3.00	<3.00	100	37	33	+/+	3909	3364	3900	3400	3.59	3.53	37	33	3909	3364	3900	3400	3.59	3.53
		10000	>150	>150	0	0					1000	6	4	+/+							6	4						
4072	Selles sur cher	10	6	6	6	6	60	60	1.78 Ne	1.78 Ne	10	4	4	+/+	40	40	40	40	1.60 Ne	1.60 Ne	4	4	40	40	40	40	1.60 Ne	1.60 Ne
		100	1	2	1	2					100	0	0	+/							0	0						
4073	raw milk	10000	15	15	15	15	140000	150000	5.15	5.18	1000	52	33	+/+	49091	40000	49000	40000	4.69	4.60	52	33	49091	40000	49000	40000	4.69	4.60
		100000	0	2	0	2					100000	2	11	+/+							2	11						
4074	Semi-skimmed pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	10	0	0	/	<10	<10	<10	<10	<1.00	<1.00	0	0	<10	<10	<10	<10	<1.00	<1.00
		100	0	0	0	0					100	0	0	/							0	0						
4075	Semi-skimmed pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	10	0	0	/	<10	<10	<10	<10	<1.00	<1.00	0	0	<10	<10	<10	<10	<1.00	<1.00
		100	0	0	0	0					100	0	0	/							0	0						
4249	Rice pudding	10	0	0	0	0	<10	<10	<1.00	<1.00	10	0	0	/	<10	<10	<10	<10	<1.00	<1.00	0	0	<10	<10	<10	<10	<1.00	<1.00
		100	0	0	0	0					100	0	0	/							0	0						
4250	Chantilly (black forest)	10	188	198	188	198	1900	2000	3.28	3.30	10	/	/	+/+	800	1900	800	1900	2.90	3.28	/	/	1100	2000	1100	2000	3.04	3.30
		100	24	19	24	19					100	8	19	+/+							11	20						
4379	Chantilly (choux pastry with chantilly)	100	>150	>150	/	/	54000	42000	4.73 N'	4.62 N'	100	>150	>150	/	47000	41000	47000	41000	4.67 N'	4.61 N'	>150	>150	47000	41000	47000	41000	4.67	4.61
		1000	54	42	54	42					1000	47	41	+/+							47	41						
4380	Tiramisu	100000	89	89	89	89	8600000	9100000	6.93	6.96	100000	95	90	+/+	9727273	8454545	9700000	8500000	6.99	6.93	95	90	9727273	8545455	9700000	8500000	6.99	6.93
		1000000	6	11	6	11					1000000	12	3	+/+							12	4						
4381	Tomme blanche	1000	74	66	30	40	32000	36000	4.51	4.56	1000	12	15	+/+	12727	13636	13000	14000	4.11	4.15	21	24	20909	22727	21000	23000	4.32	4.36
		10000	8	10	5	0					10000	2	0	+/							2	1						
4382	Nougat ice-cream	10	39	42	39	42	410	390	2.61	2.59	10	27	22	+/+	273	227	270	230	2.43	2.36	38	35	382	355	380	360	2.58	2.55
		100	7	2	6	1					100	3	3	+/+							4	4						
4383	Salted butter caramel ice-cream	10	33	33	13	26	150	260	2.18	2.41	10	13	9	+/+	118	90	120	90	2.08	1.95 Ne	28	14	255	145	260	150	2.41	2.16
		100	5	9	3	2					100	0	1	/+							0	2						
4384	Semi-skimmed pasteurised milk	1000	25	40	25	40	26000	39000	4.41	4.59	1000	0 (42 white)	0 (25 white)	/	<1000	<1000	<1000	<1000	<3.00	<3.00	49	32	47273	30000	47000	30000	4.67	4.48
		10000	4	3	4	3					10000	0 (2 white)	0 (1 white)	/							3	1						

4385	Fromage frais made with whole raw milk	100	illegible (mould)		/	/	<4000	<4000	<3.60	<3.60	10	3	6	+/+	<40	60	<40	60	<1.60	1.78	42	44	418	464	420	460	2.62	2.67
		1000	3	6	0	3					100	2	0	+/-					Detection	Ne	4	7						
4450	Goat's cheese made with raw milk	10	>450	>450	/	/	>15000	>15000	>4.18	>4.18	10	>450	>450	+/+	>15000	>15000	>15000	>15000	>4.18	>4.18	>450	>450	>15000	>15000	>15000	>15000	>4.18	>4.18
		100	>150	>150							100	>150	>150	+/+							>150	>150						
4451	Pasteurised fresh cream	10	0	0	0	0	<10	<10	<1.00	<1.00	10	0	3	/+	<10	<40	<1.00	<40	<1.00	<1.60	0	3	<10	<40	<10	<40	<1.00	<1.60
		100	0	0	0	0					100	1	0	+/-							Detection	1						
4452	Butter made with pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	100	1	3	+/+	<400	<400	<400	<400	<2.60	<2.60	1	3	<400	<400	<400	<400	<2.60	<2.60
		100	0	0	0	0					1000	0	0	/							Detection	detection						
4453	Mozzarella	1000	0	0	0	0	<1000	<1000	<3.00	<3.00	1000	2	0	+/-	<4000	<1000	<4000	<1000	<3.60	<3.00	2	0	<4000	<1000	<4000	<1000	<3.60	<3.00
		10000	0	0	0	0					10000	0	0	/							Detection	0						
4454	Mozzarella	100	47	37	0	0	<100	<100	<2.00	<2.00	100	0	0	/	<100	<100	<100	<100	<2.00	<2.00	0	0	<100	<100	<100	<100	<2.00	<2.00
		1000	5	10	0	0					1000	0	0	/							0	0						
4552	Goat's cheese made with raw milk	1000000	>150	>150	/	/	<10000000	<10000000	<7.00	<7.00	/	/	/	/	/	/	/	/	/	/							/	/
		10000000	27	30	0	0					/	/	/	/														
4553	Ewe's cheese made with raw milk	100000	>150	>150	/	/	<10000000	<10000000	<7.00	<7.00	/	/	/	/	/	/	/	/	/	/							/	/
		1000000	21	28	0	0					/	/	/	/														
4554	Goat's cheese made with raw milk	10000	>150 (secondary flora)	>150 (secondary flora)	/	/	/	/	Uninterpretable result	Uninterpretable result	/	/	/	/	/	/	/	/	/	/							/	/
		100000	>150 (secondary flora)	>150 (secondary flora)	/	/					/	/	/	/														
4555	Salted butter made with raw milk	10	22 (95)	23(96)	22 (95)	23(96)	270(1100)	260(1100)	2.43	2.41	100	55	44	+/+	5545	4455	5500	4500	3.74	3.65	61	51	6091	5091	6100	5100	3.79	3.71
		100	8(19)	5(25)	8(19)	5(25)					1000	6	5	+/+							6	5						
4556	Salted butter made with raw milk	10	10(27)	21(34)	10(34)	21(34)	140(340)	220(380)	2.15	2.34	/	/	/	/	/	/	/	/	/	/							/	/
		100	5(10)	3(8)	5(8)	3(8)					/	/	/	/														
4557	Mozzarella	100	58(microcolonies) (112)		58(112)		5600(11000)		3.75	/	100	136	/	+	13727	/	14000	/	4.15	/	140	/	14182	/	14000	/	4.15	/
		1000	4(14)		4(14)						1000	15	/	+							16	/						
4558	Mozzarella	100	17(29)		17(29)		2100(3400)		3.32	/	100	58	/	+	5909	/	5900	/	3.77	/	65	/	6545	/	6500	/	3.81	/
		1000	6(8)		6(8)						1000	7	/	+							7	/						
4559	Semi-skimmed pasteurised milk	1000	4 (microcolonies)(30)		16(30)		18000(35000)		4.26	/	100	141	/	+	13545	/	14000	/	4.15	/	145	/	13909	/	14000	/	4.15	/
		10000	0(8)		4(8)						1000	8	/	+							8	/						
4560	Pasteurised whole milk	100	62(100)		62(100)		6200(11000)		3.79	/	1000	11	/	+	10909	/	11000	/	4.04	/	17	/	16364	/	16000	/	4.20	/
		1000	6(19)		6(19)						10000	1	/	+							1	/						
4561	Goat's cheese made with pasteurised milk	1000	Secondary flora (mould)		/	/	/	/	Uninterpretable result	Uninterpretable result	100	131	/	+	12545	/	13000	/	4.11	/	136	/	13000	/	13000	/	4.11	/
		10000			/	/					1000	7	/	+							7	/						
4843	Vanilla raspberry jar	10000	58	62	58	62	650000	630000	5.81	5.80	10000	56	/	+	590909	/	590000	/	5.77	/	63	/	654545	/	650000	/	5.81	/
		100000	13	7	13	7					100000	9	/	+							9	/						
4844	Crème brûlée and red fruit jar	10000	53	49	53	49	520000	490000	5.72	5.69	10000	39	/	+	381818	/	380000	/	5.58	/	39	/	381818	/	380000	/	5.58	/
		100000	4	5	4	5					100000	3	/	+							3	/						
4845	Mascarpone raspberry jar	1000	47	49	47	49	45000	47000	4.65	4.67	1000	47	/	+	46364	/	46000	/	4.66	/	51	/	50000	/	50000	/	4.70	/
		10000	3	3	3	3					10000	4	/	+							4	/						
4846	Bethmale	1000	unreadable (secondary flora)	unreadable (secondary	/	/	<1000	<1000	<3.00	<3.00	10	73	/	+	773	/	770	/	2.89	/	79	/	836	/	840	/	2.92	/

SOLABIA																													
				flora)																									
4847	Tiramisu log	10000	34	37	0	0					100	12	/	+						5.08			13	/					
		1000	119	125	119	125	120000	120000	5.08	5.08	1000	119	/	+	117273	/	120000	/	5.08			120	/	118182	/	120000	/	5.08	/
		10000	10	8	10	8					10000	10	/	+									10	/					

(): 72 h reading result

DAIRY PRODUCTS																										
Spl. no.	Product	XP/ISO TS 11059 reference method *									RHAPSODY alternative method - Spiral															
		Dilution	Before confirmation		After confirmation				log CFU/g		Dilution	Reading zone (rep 1/ rep 2)	45 h reading								72 h reading					
			CFU/plate		CFU/plate		CFU/g						CFU/plate		Confirm (ox;BCP) Rep1/Rep2	CFU/g		log CFU/g		CFU/plate		CFU/g				
			Rep1	Rep2	Rep1	Rep2	Rep1	Rep2					Rep1	Rep2		Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2			
3943	Morbier made with raw milk	100	35	34	0	0	<100	<100	<2.00	<2.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		1000	3	3	0	0																				
3944	Raw cream	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		100	0	0	0	0																				
3945	Mozzarella	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		100	0	0	0	0																				
3946	Semi-skimmed pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		100	0	0	0	0																				
3947	Raw milk	10000	27	33	27	33	250000	310000	5.40	5.49	10	3/4	53	63	+/+	110000	70000	5.04	4.85	45	57	89000	63000			
		100000	1	1	1	1																				
4071	Country style Saint Nectaire	1000	>150	>150	0	0	<1000	<1000	<3.00	<3.00	10	st	22	21	+/+	4400	4200	3.64	3.62	22	21	4400	4200			
		10000	>150	>150	0	0																				
4072	Selles sur cher	10	6	6	6	6	60	60	1.78	1.78	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		100	1	2	1	2			Ne	Ne																
4073	raw milk	10000	15	15	15	15	140000	150000	5.15	5.18	10	st	88	75	+/+	15000	18000	4.18	4.26	88	76	18000	15000			
		100000	0	2	0	2																				
4074	Semi-skimmed pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		100	0	0	0	0																				
4075	Semi-skimmed pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		100	0	0	0	0																				
4249	Rice pudding	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			
		100	0	0	0	0																				
4250	Chantilly (black forest)	10	188	198	188	198	1900	2000	3.28	3.30	10	st	2	1	+/+	<800	<800	<2.90	<2.90	3	1	<800	<800			
		100	24	19	24	19																				
4379	Chantilly (choux pastry with chantilly)	100	>150	>150	/	/	54000	42000	4.73	4.62	10	5	77	69	+/+	51000	45000	4.71	4.65	55	41	61000	45000			
		1000	54	42	54	42			N'	N'																
4380	Tiramisu	100000	89	89	89	89	8600000	9100000	6.93	6.96	1000	3	54	55	+/+	11000000	11000000	7.04	7.04	63	51	12000000	10000000			
		1000000	6	11	6	11																				
4381	Tomme blanche	1000	74	66	30	40	32000	36000	4.51	4.56	10	6	56	69	+/+	22000	28000	4.34	4.45	76	78	30000	31000			
		10000	8	10	5	0																				
4382	Nougat ice-cream	10	39	42	39	42	410	390	2.61	2.59	10	st	1	3	+/+	<800	<800	<2.90	<2.90	1	3	<800	<800			
		100	7	2	6	1											Detection	Detection								
4383	Salted butter caramel ice-cream	10	33	33	13	26	150	260	2.18	2.41	10	st	3	2	+/+	<800	<800	<2.90	<2.90	3	2	<800	<800			
		100	5	9	3	2											Detection	Detection								
4384	Semi-skimmed pasteurised milk	1000	25	40	25	40	26000	39000	4.41	4.59	10	st (6)	0 (76 white)	0 (64 white)	/	<200	<200	<2.30	<2.30	73	75	29000	30000			
		10000	4	3	4	3																				
4385	Fromage frais made with whole raw milk	100	illegible (mould)		/	/	<4000	<4000	<3.60	<3.60	10	st	1	2	+/+	<800	<800	<2.90	<2.90	1	3	<800	<800			
		1000	3	6	0	3											Detection	Detection								
4450	Goat's cheese made with raw milk	10	>450	>450	/	/	>15000	>15000	>4.18	>4.18	10	1	unreadable	unreadable	/	/	/	Uninterpretable	Uninterpretable	unreadable	unreadable	/	/	Un		
		100	>150	>150																						
4451	Pasteurised fresh	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	0	/	<200	<200	<2.30	<2.30	0	0	<200	<200			

♦ Test conducted under accreditation
ADRIA Développement
Summary report (Version 0) - RHAPSODY Agar

DAIRY PRODUCTS																										
Spl. no.	Product	XP/ISO TS 11059 reference method [*]									RHAPSODY alternative method - Spiral															
		Dilution	Before confirmation		After confirmation				log CFU/g		Dilution	Reading zone (rep 1/ rep 2)	45 h reading								72 h reading					
			CFU/plate		CFU/plate		CFU/g						CFU/plate		Confirm (ox;BCP) Rep1/Rep2	CFU/g		log CFU/g		CFU/plate		CFU/g				
			Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2			Rep1	Rep2		Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	
	cream	100	0	0	0	0																				
4452	Butter made with pasteurised milk	10	0	0	0	0	<10	<10	<1.00	<1.00	10	st	0	1	/+	<200	<800	<2.30	<2.90	0	1	<200	<800			
		100	0	0	0	0												Detection								
4453	Mozzarella	1000	0	0	0	0	<1000	<1000	<3.00	<3.00	10	st	4	4	+/+	800	800	2.90	2.90	4	4	800	800			
		10000	0	0	0	0																				
4454	Mozzarella	100	47	37	0	0	<100	<100	<2.00	<2.00	10	st	1	0	+/	<800	<200	<2.90	<2.30	1	0	<800	<200			
		1000	5	10	0	0												Detection								
4552	Goat's cheese made with raw milk	1000000	>150	>150	/	/	<10000000	<10000000	<7.00	<7.00	100	2	71	54	+/+	2800000	21000000	6.45	7.32	58	66	2300000	2600000			
		100000000	27	30	0	0																				
4553	Ewe's cheese made with raw milk	100000	>150	>150	/	/	<100000000	<100000000	<7.00	<7.00	100	st	10	8	+/+	20000	16000	4.30	4.20	10	8	20000	16000			
		1000000	21	28	0	0																				
4554	Goat's cheese made with raw milk	10000	>150 (secondary flora)	>150 (secondary flora)	/	/	/	/	Uninterpretable	Uninterpretable	100	5	52	53	+/+	340000	350000	5.53	5.54	50	55	330000	360000			
		100000	>150 (secondary flora)	>150 (secondary flora)	/	/																				
4555	Salted butter made with raw milk	10	22 (95)	23(96)	22 (95)	23(96)	270(1100)	260(1100)	2.43	2.41	10	st	27	22	+/+	5400	4400	3.73	3.64	29	28	5800	5600			
		100	8(19)	5(25)	8(19)	5(25)			3.04 (72h)	3.04 (72h)																
4556	Salted butter made with raw milk	10	10(27)	21(34)	10(34)	21(34)	140(340)	220(380)	2.15	2.34	10	st	13	10	+/+	2600	2000	3.41	3.30	13	10	2600	2000			
		100	5(10)	3(8)	5(8)	3(8)			2.53 (72h)	2.58 (72h)																
4557	Mozzarella	100	58(microcolonies) (112)		58(112)		5600(11000)		3.75	/	10	5	43	/	+	28000	/	4.45	/	44	/	29000	/			
		1000	4(14)		4(14)				4.04 (72h)																	
4558	Mozzarella	100	17(29)		17(29)		2100(3400)		3.32	/	10	st	39	/	+	7800	/	3.89	/	40	/	8000	/			
		1000	6(8)		6(8)				3.53 (72h)																	
4559	Semi-skimmed pasteurised milk	1000	4 (microcolonies)(30)		16(30)		18000(35000)		4.26	/	10	st	61	/	+	12000	/	4.08	/	69	/	14000	/			
		10000	0(8)		4(8)				4.54 (72h)																	
4560	Pasteurised whole milk	100	62(100)		62(100)		6200(11000)		3.79	/	10	st	84	/	+	17000	/	4.23	/	91	/	18000	/			
		1000	6(19)		6(19)				4.04 (72h)																	
4561	Goat's cheese made with pasteurised milk	1000	Secondary flora (mould)		/	/	/	/			10	st	63	/	+	13000	/	4.11	/	66	/	13000	/			
		10000			/	/																				
4843	Vanilla raspberry jar	10000	58	62	58	62	650000	630000	5.81	5.80	1000	st	37	43	+	720000	880000	5.86	5.94	37	43	720000	880000			
		100000	13	7	13	7																				
4844	Crème brûlée and red fruit jar	10000	53	49	53	49	520000	490000	5.72	5.69	10	1	56	59	+	560000	600000	5.75	5.78	59	61	600000	620000			
		100000	4	5	4	5																				
4845	Mascarpone raspberry jar	1000	47	49	47	49	45000	47000	4.65	4.67	10	5	91	87	+	59000	57000	4.77	4.76	93	82	60000	54000			
		10000	3	3	3	3																				
4846	Bethmale	1000	unreadable (secondary flora)	illegible (secondary flora)	/	/	<1000	<1000	<3.00	<3.00	10	st	3	4	+	<800	800	<2.90	2.90	3	4	<800	800			
		10000	34	37	0	0												Detection								
4847	Tiramisu log	1000	119	125	119	125	120000	120000	5.08	5.08	10	3	75	69	+	150000	130000	5.18	5.11	79	72	160000	140000			
		10000	10	8	10	8																				

Appendix 7 - Accuracy study: Summary of results

Spl. no.	Product	ISO method*		RHAPSODY method							
		log CFU/g ISO		Spreading method				Spiral method			
				log CFU/g 45h		log CFU/g 72h		log CFU/g 45h		log CFU/g 72h	
		Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2
3938	Plan lardons	<1.00	<1.00	<1.60	<1.00	<1.60	<1.00	<2.30	<2.30	<2.90	<2.30
3939	Chipolatas	5.81	5.66	5.52	5.54	5.52	5.58	5.48	5.48	5.52	5.49
3940	Pork chop	6.53	6.38	6.04	5.98	6.15	6.04	6.04	6.08	6.04	6.08
3941	Turkey cutlet	5.46	5.48	5.40	5.28	5.49	5.41	5.30	5.26	5.36	5.32
3942	Rump steak	6.36	6.48	6.30	6.26	6.40	6.40	6.43	6.46	6.45	6.46
4066	Slice of leg of lamb	3.85	3.60	3.86	4.00	3.86	4.00	3.78	3.76	3.78	3.82
4067	Salted pork belly	2.51	2.18	<1.00	<1.00	2.08	2.00	<2.90	<2.90	<2.90	<2.90
4068	Muzzle pâté with parsley	2.46	2.48	2.04	2.20	2.11	2.23	<2.90	<2.90	<2.90	<2.90
4069	Pork muzzle with tongue	<2.00	<2.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
4070	Cooked ham	<1.60	<1.60	1.60	1.70	1.60	1.70	<2.30	<2.30	<2.90	<2.30
4244	Salami	<1.00	<1.60	<1.60	<1.00	<1.60	<1.00	<2.30	<2.30	<2.30	<2.30
4245	Dried sausage	1.70	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
4246	Rolled pork belly	5.00	4.96	4.86	4.92	4.93	4.95	5.15	4.93	5.08	4.94
4247	Raw chicken thigh	4.66	4.74	4.93	4.79	4.96	4.82	4.70	4.72	4.71	4.79
4248	Quail	<5.60	<5.60	<5.60	<5.60	<5.60	<5.60	4.68	4.68	4.83	4.70
4439	Frozen minced steak	2.62	2.75	2.28	2.58	2.52	2.64	<2.90	<2.30	<2.90	<2.30
4440	Frozen beef fillet tournedos	3.90	3.91	3.45	3.49	3.56	3.65	3.51	3.62	3.60	3.70
4441	Frozen top sirloin steak	2.36	2.36	2.11	2.00	2.32	2.20	<2.90	<2.30	<2.90	<2.30
4442	Frozen veal cutlet	2.41	2.68	2.00	2.36	2.15	2.45	<2.90	<2.30	<2.90	<2.90
4443	Frozen filet mignon	4.71	4.66	4.30	4.43	4.65	4.54	4.56	4.40	4.53	4.56
4444	Frozen turkey stir-fry	3.67	3.82	3.66	4.68	3.68	3.69	3.76	3.73	3.81	3.79
4445	Hen	6.18	6.08	6.18	6.08	6.26	6.15	6.18	6.18	6.52	6.51
4446	Duck thigh	8.32	8.32	8.23	8.15	8.28	8.18	8.11	8.08	8.11	8.15
4447	Coppa	3.59	3.30	2.96	3.00	3.04	3.04	2.90	2.90	2.90	2.90
4448	Cooked ham	3.64	3.53	3.52	3.46	3.52	3.46	3.98	3.58	3.98	3.90
4449	Pâté	4.08	4.08	3.90	3.90	3.92	3.93	4.48	4.32	4.49	4.34
3943	Morbier made with raw milk	<2.00	<2.00	<1.60	<1.00	<1.60	<1.00	<2.30	<2.30	<2.30	<2.30
3944	Raw cream	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
3945	Mozzarella	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
3946	Semi-skimmed pasteurised milk	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
3947	Raw milk	5.40	5.49	5.18	5.40	5.18	5.41	5.04	4.85	4.95	4.80
4071	Country style Saint Nectaire	<3.00	<3.00	3.59	3.53	3.59	3.53	3.64	3.62	3.64	3.62

* Test conducted under accreditation

Spl. no.	Product	ISO method*		RHAPSODY method							
		log CFU/g ISO		Spreading method				Spiral method			
				log CFU/g 45h		log CFU/g 72h		log CFU/g 45h		log CFU/g 72h	
		Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2	Rep1	Rep2
4072	Selles sur cher	1.78	1.78	1.60	1.60	1.60	1.60	<2.30	<2.30	<2.30	<2.30
4073	raw milk	5.15	5.18	4.69	4.60	4.69	4.60	4.18	4.26	4.26	4.18
4074	Semi-skimmed pasteurised milk	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
4075	Semi-skimmed pasteurised milk	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
4249	Rice pudding	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.30	<2.30	<2.30	<2.30
4250	Chantilly (black forest)	3.28	3.30	2.90	3.28	3.04	3.30	<2.90	<2.90	<2.90	<2.90
4379	Chantilly (choux pastry with chantilly)	4.73	4.62	4.67	4.61	4.67	4.61	4.71	4.65	4.79	4.65
4380	Tiramisu	6.93	6.96	6.99	6.93	6.99	6.93	7.04	7.04	7.08	7.00
4381	Tomme blanche	4.51	4.56	4.11	4.15	4.32	4.36	4.34	4.45	4.48	4.49
4382	Nougat ice-cream	2.61	2.59	2.43	2.36	2.58	2.55	<2.90	<2.90	<2.90	<2.90
4383	Salted butter caramel ice-cream	2.18	2.41	2.08	1.95	2.41	2.16	<2.90	<2.90	<2.90	<2.90
4384	Pasteurised milk (semi-skimmed)	4.41	4.59	<3.00	<3.00	4.67	4.48	<2.30	<2.30	4.46	4.48
4385	Fromage frais made with whole raw milk	<3.60	<3.60	<1.60	1.78	2.62	2.67	<2.90	<2.90	<2.90	<2.90
4450	Goat's cheese made with raw milk	>4.18	>4.18	>4.18	>4.18	>4.18	>4.18				
4451	Pasteurised fresh cream	<1.00	<1.00	<1.00	<1.60	<1.00	<1.60	<2.30	<2.30	<2.30	<2.30
4452	Butter made with pasteurised milk	<1.00	<1.00	<2.60	<2.60	<2.60	<2.60	<2.30	<2.90	<2.30	<2.90
4453	Mozzarella	<3.00	<3.00	<3.60	<3.00	<3.60	<3.00	2.90	2.90	2.90	2.90
4454	Mozzarella	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00	<2.90	<2.30	<2.90	<2.30
4552	Goat's cheese made with raw milk	<7.00	<7.00	/	/	/	/	6.45	7.32	6.36	6.41
4553	Ewe's cheese made with raw milk	<7.00	<7.00	/	/	/	/	4.30	4.20	4.30	4.20
4554	Goat's cheese made with raw milk	/	/	/	/	/	/	5.53	5.54	5.52	5.56
4555	Salted butter made with raw milk	2.43	2.41	3.74	3.65	3.79	3.71	3.73	3.64	3.76	3.75
4556	Salted butter made with raw milk	2.15	2.34	/	/	/	/	3.41	3.30	3.41	3.30
4561	Goat's cheese made with pasteurised milk	/	/	4.11	/	4.11	/	4.11	/	4.11	/
4843	Vanilla raspberry jar	5.81	5.80	5.77	/	5.81	/	5.86	5.94	5.86	5.94
4844	Crème brûlée and red fruit jar	5.72	5.69	5.58	/	5.58	/	5.75	5.78	5.78	5.79
4845	Mascarpone raspberry jar	4.65	4.67	4.66	/	4.70	/	4.77	4.76	4.78	4.73
4846	Bethmale	<3.00	<3.00	2.89	/	2.92	/	<2.90	2.90	<2.90	2.90
4847	Tiramisu log	5.08	5.08	5.08	/	5.08	/	5.18	5.11	5.20	5.15

Appendix 8 - Limit of detection (LOD) and limit of quantification (LOQ): raw results

1 ml spread onto 3 plates

PCA

	T1	T2	T3
CFU/ml*	0.7	1	3.2

*: mean result obtained from 10 plates

Target rate CFU/ml	Inoculum CFU/ml	Replicate (CFU/ml)					
		1	2	3	4	5	6
0	/	0	0	0	0	0	0
0.5	0.7	0	0	1	0	0	1
1	1	0	1	1	0	1	0
5	3.2	1	2	2	5	5	2

Level	Number of results results	Standard deviation So	Biais X0 (Xoi median)
0	0/6	/	/
1	2/6	0.516	0
2	3/6	0.548	0.5
3	6/6	1.722	2

	Formula	Theoretical obtained
LC (1ml)	$1.65 So + Xo$	1.4
LOD (1ml)	$3.3 So + Xo$	2.3
LOQ (1ml)	$10So + Xo$	6.0

0.1 ml spread onto 1 plate

PCA

	T1	T2	T3
CFU/ml*	3.2	11	51

*: mean result obtained from 10 plates

Target rate CFU/ml	Inoculum CFU/ml	Replicate (CFU/ml)					
		1	2	3	4	5	6
0	/	0	0	0	0	0	0
5	3.2	0	20	0	0	10	0
10	11	0	0	20	20	0	10
50	51	50	50	80	90	50	70

Level	Number of results results	Standard deviation So	Biais X0 (Xoi median)
0	0/6	/	/
1	2/6	8.367	0
2	3/6	9.832	5
3	6/6	17.607	60

	Formula	Theoretical obtained
LC (0.1ml)	$1.65 So + Xo$	21.2
LOD (0.1ml)	$3.3 So + Xo$	37.4
LOQ (0.1ml)	$10So + Xo$	103.3

Spiral

PCA

	T1	T2	T3
CFU/ml*	11	18	51

*: mean result obtained from 10 plates

Target rate CFU/ml	Inoculum CFU/ml	Replicate (CFU/ml)					
		1	2	3	4	5	6
0	/	0	0	0	0	0	0
10	11	20	0	0	0	0	0
20	18	0	20	20	0	20	0
50	51	100	20	80	40	20	40

Level	Number of results results	Standard deviation So	Biais X0 (Xoi median)
0	0/6	/	/
1	1/6	8.165	0
2	3/6	10.954	10
3	6/6	32.863	40

	Formula	Theoretical obtained
LC (0.05ml)	$1.65 So + Xo$	28.1
LOD (0.05ml)	$3.3 So + Xo$	46.1
LOQ (0.05ml)	$10So + Xo$	119.5

Appendix 9 - Inclusivity/Exclusivity: raw results

INCLUSIVITY								
No.	Strains		Reference	Origin	CFU/plate			
					PCA	RHAPSODY	ISO 13720 (CFC)	ISO 11059 (PPA)
1	<i>Pseudomonas</i>	<i>jessenii</i>	Ad1143	Pasteurised milk	15	22	20	23
2	<i>Pseudomonas</i>	<i>aeruginosa</i>	20	Raw milk	24	36	37	33
3	<i>Pseudomonas</i>	<i>aeruginosa</i>	Ad1531	River water	63	76	68	69
4	<i>Pseudomonas</i>	<i>aeruginosa</i>	Ad1536	/	67	48	57	60
5	<i>Pseudomonas</i>	<i>aeruginosa</i>	Ad1553	Water environment	67	67	65	73
6	<i>Pseudomonas</i>	<i>aeruginosa</i>	Ad1558	Water	33	58	56	53
7	<i>Pseudomonas</i>	<i>aeruginosa</i>	Ad1884	Floor cloth	36	47	59	65
8	<i>Pseudomonas</i>	<i>fluorescens</i>	D2	Degraded ham	37	55	16	19
9	<i>Pseudomonas</i>	<i>fluorescens</i>	7	Non-pasteurised liquid egg portion	73	50	56	59
10	<i>Pseudomonas</i>	<i>fluorescens</i>	16	Non-pasteurised liquid egg portion	30	40	25	29
11	<i>Pseudomonas</i>	<i>fluorescens</i>	21	/	22	48	27	37
12	<i>Pseudomonas</i>	<i>fluorescens</i>	Ad1246	Salmon	42	44	46	50
13	<i>Pseudomonas</i>	<i>fluorescens</i>	Ad1515	Egg adherence to section of circuit	39	37	51	43
14	<i>Pseudomonas</i>	<i>fluorescens</i>	Ad1691	Salmon	15	17 (pale blue at 45 h)	14	17
15	<i>Pseudomonas</i>	<i>fragi</i>	Ad1327	Liquid egg portions	23	13 (pale at 45 h)	16	24
16	<i>Pseudomonas</i>	<i>otitidis</i>	Ad1880	Turkey skin	31	0	43	39
17	<i>Pseudomonas</i>		Ad2261		44	42 (pale blue and small at 45 h)	57	69
18	<i>Pseudomonas</i>	<i>pseudo alcaligenes</i>	Ad1592	Water environment	43	33	24	30

INCLUSIVITY								
No.	Strains		Reference	Origin	CFU/plate			
					PCA	RHAPSODY	ISO 13720 (CFC)	ISO 11059 (PPA)
19	<i>Pseudomonas</i>	<i>putida</i>	3	/	22	19 (pale blue at 45 h)	20	24
20	<i>Pseudomonas</i>	<i>putida</i>	D7	Degraded ham	140/17	89/8	>150/38	>150/25
21	<i>Pseudomonas</i>	<i>putida</i>	4	Poultry	85/5	233/20	204/19	255/20
22	<i>Pseudomonas</i>	<i>putida</i>	5	Non-pasteurised liquid egg portion	119/10	227/27 (pale blue at 45 h)	148/11	122/12
23	<i>Pseudomonas</i>	<i>sp.</i>	Ad2263	Quail	117	130	146	148
24	<i>Pseudomonas</i>	<i>putida</i>	Ad1331	Liquid egg portions	21	30	32	33
25	<i>Pseudomonas</i>	<i>putida</i>	Ad1539	Soil	50	64	52	68
26	<i>Pseudomonas</i>	<i>putida</i>	Ad1591	Water environment	103	67 (pale blue and small at 45 h)	152	165
27	<i>Pseudomonas</i>	<i>sp.</i>	Ad2005	Process water	147/13	0/0	122/12	127/17
28	<i>Pseudomonas</i>	<i>spp.</i>	Ad1715	Liquid egg portions	26	40	47	43
29	<i>Pseudomonas</i>	<i>stutzeri</i>	Ad1593	Water environment	33	37	31	35
30	<i>Pseudomonas</i>	<i>veronii</i>	Ad1588	Industrial environment	42	25	35	34
31	<i>Pseudomonas</i>	<i>fragi</i>	Ad2245	Minced steak	26	15 (pale blue at 45 h)	27	20
32	<i>Pseudomonas</i>	<i>migulae</i>	Ad2246	Beef tartar	65	81	98	117
33	<i>Pseudomonas</i>	<i>psychrophila</i>	Ad2248	Leg of lamb	37	45	38	43
34	<i>Pseudomonas</i>	<i>migulae</i>	Ad2247	Minced steak	81	68 (blue microcolonies at 45 h)	106	81
35	<i>Pseudomonas</i>	<i>fluorescens</i>	Ad2249	Raw milk	13/120	28/204	18/196	18/173
36	<i>Pseudomonas</i>	<i>sp.</i>	Ad2250	Chipolatas	26	27	32	23
37	<i>Pseudomonas</i>	<i>sp.</i>	Ad2252	Veal cutlet	19	13	24	16
38	<i>Pseudomonas</i>	<i>fluorescens</i> group	Ad2253	Pork chop	54	33	49	31

INCLUSIVITY								
No.	Strains		Reference	Origin	CFU/plate			
					PCA	RHAPSODY	ISO 13720 (CFC)	ISO 11059 (PPA)
39	<i>Pseudomonas</i>	<i>fluorescens</i> group	Ad2257	Chicken fillet	131	134	149	139
40	<i>Pseudomonas</i>	<i>fluorescens</i> group	Ad2259	Forest terrine	123	132 (very pale blue at 45 h)	137	112
41	<i>Pseudomonas</i>	<i>sp.</i>	Ad2267	Pork pâté with parsley	47	38	22	41
42	<i>Pseudomonas</i>	<i>fluorescens</i>	Ad2265	Leg of lamb	29	21	30	28
43	<i>Pseudomonas</i>	<i>sp.</i>	Ad2276	Raw milk cheese	48	68	82	63
44	<i>Pseudomonas</i>	<i>psychrophila</i>	Ad2264	Chantilly	118	144	144	157
45	<i>Pseudomonas</i>	<i>sp.</i>	Ad2270	Tiramisu	19	29	41	30
46	<i>Pseudomonas</i>	<i>sp.</i>	Ad2271	Ice-cream	31	37	34	24
47	<i>Pseudomonas</i>	<i>sp.</i>	Ad2273	Pasteurised milk	127	87 (white microcolonies at 45 h, blue at 72 h)	115	103
48	<i>Pseudomonas</i>	<i>sp.</i>	Ad2272	Pasteurised milk cheese	13	23	17	18
49	<i>Pseudomonas</i>	<i>sp.</i>	Ad2268	Saint Nectaire	128	102	128	133
50	<i>Pseudomonas</i>	<i>sp.</i>	Ad2269	Chantilly	107	134	102	147

EXCLUSIVITY												
No.	Strain		Reference	Origin	PCA		RHAPSODY (45h/72h)		ISO 13720 (CFC)		ISO 11059 (PPA)	
					Dilution	CFU/plate	Dilution	CFU/plate	Dilution	CFU/plate	Dilution	CFU/plate
1	<i>Acinetobacter</i>	<i>johnsonii</i>	Ad1317	Pasteurised liquid	-6	72	-5	0/0	-5	0	-5	0
2	<i>Aerococcus</i>	<i>viridens</i>	Ad142	Plants	-5	39	-5	0/0	-5	0	-5	0
3	<i>Aeromonas</i>	<i>punctata</i>	Ad1329	Liquid egg portions	-6	114	-5	0/0	-5	0	-5	0
4	<i>Brochothrix</i>	<i>thermosphacta</i>	Ad1702	Raw salmon	-6	31	-5	0/0	-5	0	-5	0
5	<i>Burkholderia</i>	<i>cepacia</i>	Ad1541	Environment	-7	84	-5	0/0	-5	0	-5	0
6	<i>Chryseobacterium</i>	<i>ureilyticum</i>	Ad1340	Liquid egg portions	-7	40	-5	0/0	-5	0	-6	142 (ox + -BCP -)
7	<i>Flavobacterium</i>	<i>hydratis</i>	Ad1323	Liquid egg portions	-7	34	-5	0/0	-5	0	-7	24 (ox + / BCP -)
8	<i>Gluconobacter</i>	<i>cerinus</i>	Ad374	Food supplement	-7	38	-5	0/0	-5	0	-5	0
9	<i>Ochrobactrum</i>	<i>pseudintermedius</i>	Ad1057	Turkey skin	-6	56	-3	0/0	-3	0	-6	51 (ox + / BCP -)
10	<i>Ochrobactrum</i>	sp.	Ad1916	Chicken fillet (skinless breast)	-7	57	-5	0/0	-7	46 (ox +)	-7	64 (ox -)
11	<i>Okibacterium</i>	<i>fritillariae</i>	Ad1117	macaronis	-7	30	-4	96 (cream-coloured colonies)/ 96 (pale green)	-4	0	-4	0
12	<i>Pandoraea</i>	sp.	Ad1882	Turkey abattoir	-6	40	-2	76 (blue microcolonies)/ 102 (blue microcolonies)/	-2	8(microcolonies Ox -)	-6	40 (ox -)
13	<i>Moraxella</i>		Ad423	Chicken	-5	84	-5	0/0	-5	0	-5	0
14	<i>Photobacterium</i>	<i>phosphoreum</i>	Ad1706	Salmon	-7	50	-5	0/0	-5	0	-5	0
15	<i>Plesiomonas</i>	<i>shigelloides</i>	Ad673	Fish	-6	58	-5	0/0	-5	0	-5	0

EXCLUSIVITY												
No.	Strain		Reference	Origin	PCA		RHAPSODY (45h/72h)		ISO 13720 (CFC)		ISO 11059 (PPA)	
					Dilution	CFU/plate	Dilution	CFU/plate	Dilution	CFU/plate	Dilution	CFU/plate
16	<i>Psychrobacter</i>	<i>psychrophilus</i>	Ad1343	Liquid egg portions	-6	62	-5	0/0	-5	0	-5	0
17	<i>Ralstonia</i>	<i>mannitolilytica</i>	Ad1059	Neck skin skin	-6	132	-5	0/0	-5	0	-5	0
18	<i>Shewanella</i>	<i>baltica</i>	Ad1700	Salmon	-6	54	-5	0/0	-5	0	-5	0
19	<i>Shewanella</i>	<i>putrefaciens</i>	EN 15/34	Trout	-7	113	-5	0/0	-5	0	-5	0
20	<i>Xanthomonas</i>	<i>maltophilia</i>	11.2	Plants	-7	73	-5	0/0	-5	0	-5	0
21	<i>Comamonas</i>	<i>aquatica</i>	Ad 1590	Environment	-6	105	-5	0/0	-5	0	-5	0
22	<i>Aeromonas</i>	<i>salmonicida</i>	Ad 1319	Liquid egg portions	-7	43	-5	0/0	-5	0	-5	0
23	<i>Enterobacter</i>	<i>hormaechei</i>	Ad 990	Butter	-7	99	-5	0/0	-5	0	-5	54 (ox -)
24	<i>Cronobacter</i>	<i>sakazakii</i>	Ad 952	Dairy product	-7	60	-5	0/0	-5	0	-5	0
25	<i>Citrobacter</i>	<i>freundii</i>	Ad 1326	Liquid egg portions	-7	48	-5	0/0	-5	0	-5	0
26	<i>Xanthomonas</i>	<i>maltophila</i>	60.77T (ATCC 1363)	Clinical aspects	-7	60	-5	0/0	-5	0	-5	0
27	<i>Shewanella</i>	<i>sp.</i>	Ad 1704	Shrimp	-6	36	-5	0/0	-5	0	-5	0
28	<i>Serratia</i>	<i>proteomaculans</i>	Ad 1701	Salmon	-7	45	-5	0/0	-5	0	-6	73 (ox -)
29	<i>Acinetobacter</i>	<i>baumannii</i>	Ad 1090	Haemoglobin	-7	67	-6	0/0	-6	153(microcolonies Ox +)	-6	137 (ox -)
30	<i>Burkholderia</i>	<i>vietnamiensis</i>	Ad 1538	Soil	-6	58	-3	0/0	-3	0	-3	0

Appendix 10 - Expert laboratory raw results

Laboratory	No. Spl.	ISO 13720 reference method*					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
ADRIA Total flora: 7.7x10 ⁵ /g	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	106	106	1000	3.00	100	17	1600	3.20
		100	7	7			1000	1		
	7	100	15	15	1400	3.15	100	17	1500	3.18
		1000	0	0			1000	0		
	2	100	102	102	9800	3.99	100	94	9500	3.98
		1000	6	6			1000	10		
	5	100	136	136	13000	4.11	100	130	13000	4.11
		1000	12	12			1000	14		
	1	1000	112	112	120000	5.08	1000	126	120000	5.08
		10000	17	17			10000	10		
	6	1000	109	109	100000	5.00	1000	102	99000	5.00
		10000	6	6			10000	7		

Laboratory	No. Spl.	ISO XP/TS 11059 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
ADRIA Total flora: 7.7x10 ⁵ /g	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	18	18	1700	3.23	100	17	1600	3.20
		1000	1	1			1000	1		
	7	100	11	11	1100	3.04	100	17	1500	3.18
		1000	1	1			1000	0		
	2	100	107	107	10000	4.00	100	94	9500	3.98
		1000	8	8			1000	10		
	5	100	135	135	14000	4.15	100	130	13000	4.11
		1000	14	14			1000	14		
	1	1000	109	109	110000	5.04	1000	126	120000	5.08
		10000	13	13			10000	10		
	6	1000	102	102	99000	5.00	1000	102	99000	5.00
		10000	7	7			10000	7		

* Test conducted under accreditation

Appendix 11 - Partner laboratory raw results

Laboratory	No. Spl.	ISO 13720 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
A	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	12	12	1600	3.20	100	13	1300	3.11
		1000	6	6			1000	1		
	7	100	11	11	1300	3.11	100	14	1300	3.11
		1000	3	3			1000	0		
	2	100	80	80	7800	3.89	100	100	10000	4.00
		1000	6	6			1000	12		
	5	100	63	63	7500	3.88	100	113	11000	4.04
		1000	20	20			1000	11		
	1	1000	107(diffuse colonies)	107	100000	5.00	10000	14	130000	5.11
		10000	7	7			100000	0		
	6	10000	22	22	200000	5.30	1000	112	120000	5.08
		100000	0	0			10000	18		
B	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	47	47	430	2.63	10	91	850	2.93
		100	0	0			100	2		
	7	10	44	44	400	2.60	10	91	850	2.93
		100	0	0			100	2		
	2	100	25	25	2500	3.40	100	20	2100	3.32
		1000	2	2			1000	3		
	5	100	40	40	3600	3.56	100	10	910	2.96
		1000	0	0			1000	0		
	1	1000	29	29	28000	4.45	100	150	15000	4.18
		10000	2	2			1000	11		
	6	100	120	120	13000	4.11	100	93	10000	4.00
		1000	22	22			1000	17		
C	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	70	70	700	2.85	100	20	2000	3.30
		100	7	7			1000	2		
	7	10	38	38	410	2.61	100	14	1600	3.20
		100	7	7			1000	4		
	2	100	75	75	7900	3.90	100	123	12000	4.08
		1000	12	12			1000	12		
	5	100	63	63	6200	3.79	1000	11	11000	4.04
		1000	5	5			10000	1		
	1	1000	96	96	99000	5.00	1000	135	140000	5.15
		10000	13	13			10000	22		
	6	1000	110	110	120000	5.08	1000	150	150000	5.18
		10000	18	18			10000	18		

Laboratory	No. Spl.	ISO 13720 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
D	3	10	0		<10	<1.00	10	0	<10	<1.00
		100	0				100	0		
	8	10	0		<10	<1.00	10	0	<10	<1.00
		100	0				100	0		
	4	10	107	107	1000	3.00	10	149	1400	3.15
		100	8	8			100	9		
	7	10	94	94	940	2.97	10	148	1500	3.18
		100	9	9			100	12		
	2	100	117	117	12000	4.08	100	124	13000	4.11
		1000	13	13			1000	19		
	5	100	86	86	9100	3.96	100	117	12000	4.08
		1000	14	14			1000	19		
	1	1000	133	133	130000	5.11	1000	144	140000	5.15
		10000	9	9			10000	11		
	6	10000	15	15	150000	5.18	10000	19	190000	5.28
		100000	2	2			100000	2		
E	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	27	27	2500	3.40	10	94	930	2.97
		1000	0	0			100	8		
	7	100	Reading impossible	/	7000	3.85 Ne	10	131	1200	3.08
		1000	7	7			100	6		
	2	1000	17	17	15000	4.18	100	85	8200	3.91
		10000	0	0			1000	5		
	5	1000	12	12	11000	4.04	100	75	7500	3.88
		10000	0	0			1000	7		
	1	10000	34	34	330000	5.52	1000	89	85000	4.93
		100000	2	2			10000	5		
	6	1000	115	115	110000	5.04	1000	90	88000	4.94
		10000	4	4			10000	7		
F	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	117	117	1200	3.08	100	15	1500	3.18
		100	10	10			1000	1		
	7	100	44	44	4100	3.61	10	72	670	2.83
		1000	1	1			100	2		
	2	100	63	63	6600	3.82	100	66	6800	3.83
		1000	10	10			1000	9		
	5	100	94	94	9400	3.97	100	65	6500	3.81
		1000	9	9			1000	6		
	1	1000	89	89	85000	4.93	1000	86	85000	4.93
		10000	4	4			10000	8		
	6	1000	121	121	130000	5.11	1000	74	74000	4.87
		10000	18	18			10000	7		

Laboratory	No. Spl.	ISO 13720 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
G	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	104	104	1100	3.04	10	135	1400	3.15
		100	20	20			100	17		
	7	10	92	92	930	2.97	10	118	1200	3.08
		100	10	10			100	18		
	2	100	107	107	11000	4.04	100	73	7400	3.87
		1000	17	17			1000	8		
	5	1000	17	17	18000	4.26	100	108	11000	4.04
		10000	3	3			1000	9		
	1	10000	27	27	270000	5.43	1000	136	140000	5.15
		100000	3	3			10000	18		
	6	1000	97	97	100000	5.00	1000	79	81000	4.91
		10000	14	14			10000	10		
H	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	/		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	/		
	4	10	52	52	520	2.72	10	110	1100	3.04
		100	/	/			100	/		
	7	10	51	51	510	2.71	1000	10	9100	3.96
		100	/	/			10000	0		
	2	1000	15	15	16000	4.20	1000	18	18000	4.26
		10000	3	3			10000	/		
	5	100	/	/	8000	3.90 Ne	1000	15	15000	4.18
		1000	8	8			10000	2		
	1	1000	100	100	100000	5.00	1000	111	120000	5.08
		10000	14	14			10000	17		
	6	1000	109	109	110000	5.04	1000	131	130000	5.11
		10000	10	10			10000	12		
I	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	INC	0	<10	<1.00	10	0	<10	<1.00
		100	INC	0			100	0		
	4	10	160	160	1500	3.18	100	18	1600	3.20
		100	9	9			1000	0		
	7	10	151	151	1500	3.18	100	16	1500	3.18
		100	16	16			1000	0		
	2	100	106	106	11000	4.04	100	77	7800	3.89
		1000	13	13			1000	9		
	5	100	95	95	9500	3.98	100	108	11000	4.04
		1000	10	10			1000	12		
	1	1000	110	110	120000	5.08	1000	97	100000	5.00
		10000	19	19			10000	16		
	6	1000	154	154	150000	5.18	1000	121	130000	5.11
		10000	16	16			10000	17		

Laboratory	No. Spl.	ISO 13720 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
J	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	69	69	720	2.86	10	133	1300	3.11
		100	10	10			100	6		
	7	10	71	71	730	2.86	100	17	1700	3.23
		100	9	9			1000	2		
	2	100	58	58	6300	3.80	100	96	9600	3.98
		1000	11	11			1000	10		
	5	100	52	52	5500	3.74	100	85	8500	3.93
		1000	9	9			1000	8		
	1	1000	71	71	74000	4.87	1000	74	76000	4.88
		10000	10	10			10000	10		
	6	1000	80	80	77000	4.89	1000	89	85000	4.93
		10000	5	5			10000	5		
K	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	42	42	530	2.72	10	64	670	2.83
		100	16	16			100	10		
	7	10	29	29	260	2.41	10	67	680	2.83
		100	0	0			100	8		
	2	100	63	63	7100	3.85	100	65	7500	3.88
		1000	15	15			1000	17		
	5	100	62	62	7000	3.85	100	63	7100	3.85
		1000	15	15			1000	15		
	1	1000	103	103	110000	5.04	1000	74	88000	4.94
		10000	18	18			10000	23		
	6	1000	77	77	82000	4.91	1000	140	140000	5.15
		10000	13	13			10000	16		
L	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	/	/			100	/		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	/	/			100	/		
	4	10	62	62	620	2.79	10	89	890	2.95
		100	/	/			100	/		
	7	10	23	23	230	2.36	10	88	880	2.94
		100	/	/			100	/		
	2	100	/	/	10000	4.00	100	/	12000	4.08
		1000	10	10			1000	12		
	5	1000	104	104	97000	4.99	100	/	6000	3.78 Ne
		10000	3	3			1000	6		
	1	1000	10	10	9000	3.95	1000	72	81000	4.91
		10000	0	0			10000	17		
	6	1000	128	128	140000	5.15	1000	86	85000	4.93
		10000	22	22			10000	8		

Laboratory	No. Spl.	ISO 13720 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
M	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	156	156	1500	3.18	100	14	1500	3.18
		100	14	14			1000	2		
	7	10	107	107	1100	3.04	100	20	2000	3.30
		100	13	13			1000	2		
	2	1000	21	21	21000	4.32	100	103	10000	4.00
		10000	2	2			1000	8		
	5	100	145	145	15000	4.18	100	127	12000	4.08
		1000	16	16			1000	8		
	1	10000	23	23	230000	5.36	1000	142	150000	5.18
		100000	2	2			10000	18		
	6	10000	40	40	430000	5.63	10000	19	180000	5.26
		100000	7	7			100000	1		
N	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	11	11	1200	3.08	100	18	1800	3.26
		1000	2	2			1000	2		
	7	100	10	10	910	2.96	100	19	1800	3.26
		1000	0	0			1000	1		
	2	1000	14	14	15000	4.18	100	136	14000	4.15
		10000	2	2			1000	15		
	5	100	>150	>150	9000	3.95 Ne	1000	21	22000	4.34
		1000	9	9			10000	3		
	1	1000	90	90	87000	4.94	1000	150	150000	5.18
		10000	6	6			10000	13		
	6	1000	132	132	130000	5.11	1000	149	140000	5.15
		10000	14	14			10000	10		
O	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	14	14	1300	3.11	100	13	1200	3.08
		1000	0	0			1000	0		
	7	10	149	149	1400	3.15	100	20	1900	3.28
		100	12	12			1000	1		
	2	100	125	125	12000	4.08	100	128	13000	4.11
		1000	6	6			1000	13		
	5	100	137	137	15000	4.18	100	128	13000	4.11
		1000	24	24			1000	13		
	1	10000	23	23	230000	5.36	10000	12	120000	5.08
		100000	2	2			100000	1		
	6	1000	111	111	110000	5.04	1000	127	130000	5.11
		10000	10	10			10000	11		

Laboratory	No. Spl.	ISO 13720 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
P	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	89	89	930	2.97	100	13	1400	3.15
		100	13	13			1000	2		
	7	10	106	106	1100	3.04	100	20	1800	3.26
		100	19	19			1000	0		
	2	100	107	107	11000	4.04	100	82	8000	3.90
		1000	9	9			1000	6		
	5	100	113	113	11000	4.04	100	106	11000	4.04
		1000	8	8			1000	14		
	1	1000	148	148	150000	5.18	10000	20	210000	5.32
		10000	16	16			100000	3		
	6	1000	150	150	150000	5.18	1000	130	130000	5.11
		10000	12	12			10000	12		

Laboratory	No. Spl.	ISO XP/TS 11059 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
A	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	13	13	1300	3.11	100	13	1300	3.11
		1000	1	1			1000	1		
	7	100	16	16	1700	3.23	100	14	1300	3.11
		1000	3	3			1000	0		
	2	100	84	84	8100	3.91	100	100	10000	4.00
		1000	5	5			1000	12		
	5	100	130	130	12000	4.08	100	113	11000	4.04
		1000	5	5			1000	11		
	1	1000	112	112	110000	5.04	10000	14	130000	5.11
		10000	10	10			100000	0		
	6	1000	106	106	100000	5.00	1000	112	120000	5.08
		10000	9	9			10000	18		
B	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	99	99	910	2.96	10	91	850	2.93
		100	1	1			100	2		
	7	10	82	82	750	2.88	10	91	850	2.93
		100	0	0			100	2		
	2	100	18	18	1900	3.28	100	20	2100	3.32
		1000	3	3			1000	3		
	5	100	18	18	1600	3.20	100	10	910	2.96
		1000	0	0			1000	0		
	1	100	53	53	6300	3.80	100	150	15000	4.18
		1000	16	16			1000	11		
	6	100	131	131	13000	4.11	100	93	10000	4.00
		1000	13	13			1000	17		
C	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	13	13	1300	3.11	100	20	2000	3.30
		1000	1	1			1000	2		
	7	100	16	16	1700	3.23	100	14	1600	3.20
		1000	3	3			1000	4		
	2	100	109	109	11000	4.04	100	123	12000	4.08
		1000	9	9			1000	12		
	5	100	90	90	9500	3.98	1000	11	11000	4.04
		1000	15	15			10000	1		
	1	1000	115	115	120000	5.08	1000	135	140000	5.15
		10000	19	19			10000	22		
	6	1000	116	116	120000	5.08	1000	150	150000	5.18
		10000	16	16			10000	18		

Laboratory	No. Spl.	ISO XP/TS 11059 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
D Total flora: 9.0x10 ⁵ /g	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	107	107	1100	3.04	10	149	1400	3.15
		100	11	11			100	9		
	7	10	110	110	1200	3.08	10	148	1500	3.18
		100	22	22			100	12		
	2	100	95	95	9200	3.96	100	124	13000	4.11
		1000	6	6			1000	19		
	5	100	94	94	9600	3.98	100	117	12000	4.08
		1000	12	12			1000	19		
	1	1000	100	100	110000	5.04	1000	144	140000	5.15
		10000	21	21			10000	11		
	6	10000	20	20	180000	5.26	10000	19	190000	5.28
		100000	0	0			100000	2		
E Total flora: 1.4x10 ⁶ /g	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	135	135	1300	3.11	10	94	930	2.97
		100	4	4			100	8		
	7	10	118	118	1200	3.08	10	131	1200	3.08
		100	9	9			100	6		
	2	100	75	75	7500	3.88	100	85	8200	3.91
		1000	8	8			1000	5		
	5	100	74	74	7200	3.86	100	75	7500	3.88
		1000	5	5			1000	7		
	1	1000	79	79	75000	4.88	1000	89	85000	4.93
		10000	4	4			10000	5		
	6	1000	107	107	110000	5.04	1000	90	88000	4.94
		10000	9	9			10000	7		
F Total flora: 1.1x10 ⁴ /g	3	10	0		<10	<1.00	10	0	<10	<1.00
		100	0				100	0		
	8	10	0		<10	<1.00	10	0	<10	<1.00
		100	0				100	0		
	4	10	114	114	1200	3.08	100	15	1500	3.18
		100	13	13			1000	1		
	7	10	98	98	960	2.98	10	72	670	2.83
		100	7	7			100	2		
	2	100	75	75	8000	3.90	100	66	6800	3.83
		1000	13	13			1000	9		
	5	100	92	92	9100	3.96	100	65	6500	3.81
		1000	8	8			1000	6		
	1	1000	65	65	69000	4.84	1000	86	85000	4.93
		10000	11	11			10000	8		
	6	1000	108	108	110000	5.04	1000	74	74000	4.87
		10000	12	12			10000	7		

Laboratory	No. Spl.	ISO XP/TS 11059 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
G	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	127	127	1300	3.11	10	135	1400	3.15
		100	12	12			100	17		
	7	10	108	108	1100	3.04	10	118	1200	3.08
		100	15	15			100	18		
	2	100	73	73	7300	3.86	100	73	7400	3.87
		1000	7	7			1000	8		
	5	100	139	139	14000	4.15	100	108	11000	4.04
		1000	13	13			1000	9		
	1	10000	9	9	90000	4.95	1000	136	140000	5.15
		100000	2	2			10000	18		
	6	1000	90	90	90000	4.95	1000	79	81000	4.91
		10000	9	9			10000	10		
H	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	/	/			100	/		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	/	/			100	/		
	4	10	94	94	940	2.97	10	110	1100	3.04
		100	/	/			100	/		
	7	10	89	89	890	2.95	1000	10	9100	3.96
		100	/	/			10000	0		
	2	1000	17	17	17000	4.23	1000	18	18000	4.26
		10000	2	2			10000	/		
	5	1000	20	20	19000	4.28	1000	15	15000	4.18
		10000	1	1			10000	2		
	1	1000	120	120	120000	5.08	1000	111	120000	5.08
		10000	14	14			10000	17		
	6	1000	80	80	82000	4.91	1000	131	130000	5.11
		10000	10	10			10000	12		
I	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	126	126	1300	3.11	100	18	1600	3.20
		100	17	17			1000	0		
	7	10	133	133	1300	3.11	100	16	1500	3.18
		100	14	14			1000	0		
	2	100	53	53	6100	3.79	100	77	7800	3.89
		1000	14	14			1000	9		
	5	100	113	113	12000	4.08	100	108	11000	4.04
		1000	18	18			1000	12		
	1	1000	111	111	110000	5.04	1000	97	100000	5.00
		10000	13	13			10000	16		
	6	1000	105	105	110000	5.04	1000	121	130000	5.11
		10000	14	14			10000	17		

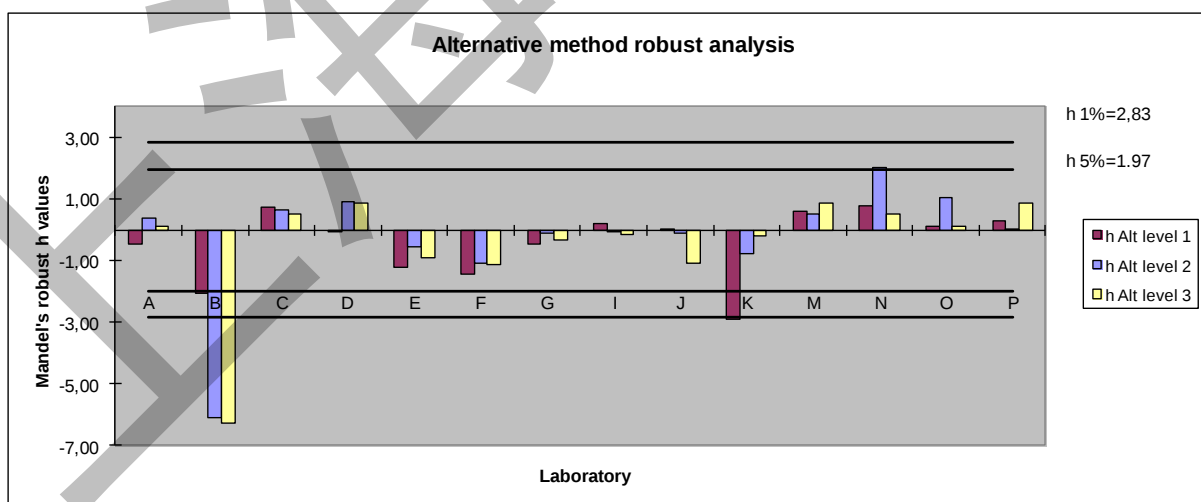
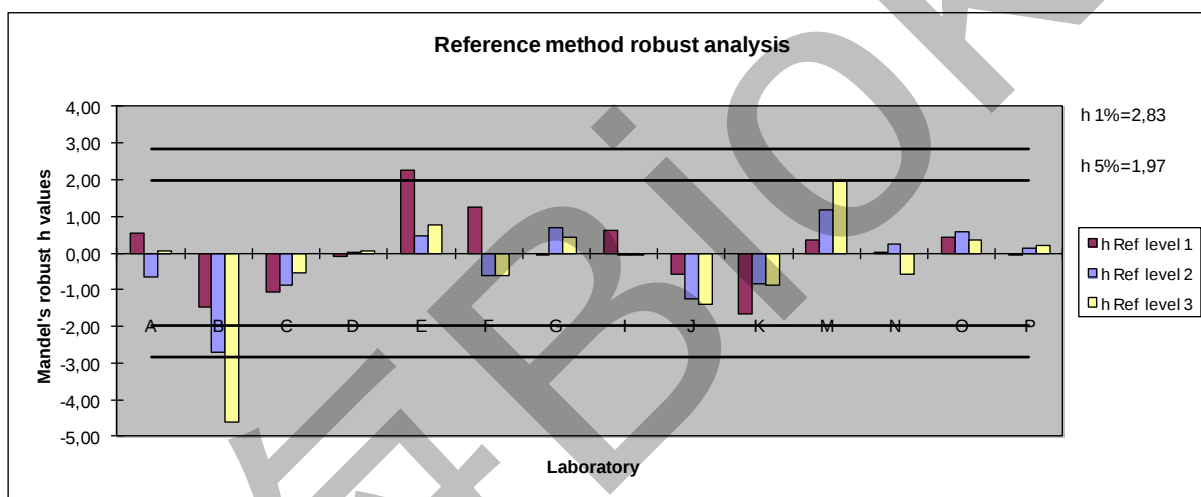
Laboratory	No. Spl.	ISO XP/TS 11059 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
J	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	150	150	1500	3.18	10	133	1300	3.11
		100	19	19			100	6		
	7	10	114	114	1200	3.08	100	17	1700	3.23
		100	17	17			1000	2		
	2	100	101	101	10000	4.00	100	96	9600	3.98
		1000	10	10			1000	10		
	5	100	61	61	6700	3.83	100	85	8500	3.93
		1000	13	13			1000	8		
	1	1000	110	110	110000	5.04	1000	74	76000	4.88
		10000	9	9			10000	10		
	6	1000	72	72	80000	4.90	1000	89	85000	4.93
		10000	16	16			10000	5		
K	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	63	63	570	2.76	10	64	670	2.83
		100	0	0			100	10		
	7	10	57	57	520	2.72	10	67	680	2.83
		100	0	0			100	8		
	2	100	57	57	6500	3.81	100	65	7500	3.88
		1000	15	15			1000	17		
	5	100	40	40	4400	3.64	100	63	7100	3.85
		1000	8	8			1000	15		
	1	1000	54	54	65000	4.81	1000	74	88000	4.94
		10000	17	17			10000	23		
	6	1000	60	60	64000	4.81	1000	140	140000	5.15
		10000	10	10			10000	16		
L	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	/	/			100	/		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	/	/			100	/		
	4	10	112	112	1100	3.04	10	89	890	2.95
		100	/	/			100	/		
	7	10	63	63	630	2.80	10	88	880	2.94
		100	/	/			100	/		
	2	100	/	/	5000	3.70 Ne	100	/	12000	4.08
		1000	5	5			1000	12		
	5	100	/	/	10000	4.00	100	/	6000	3.78 Ne
		1000	10	10			1000	6		
	1	1000	132	132	130000	5.11	1000	72	81000	4.91
		10000	6	6			10000	17		
	6	1000	59	59	57000	4.76	1000	86	85000	4.93
		10000	4	4			10000	8		

Laboratory	No. Spl.	ISO XP/TS 11059 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
M	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	126	126	1200	3.08	100	14	1500	3.18
		100	10	10			1000	2		
	7	10	113	113	1100	3.04	100	20	2000	3.30
		100	7	7			1000	2		
	2	100	107	107	11000	4.04	100	103	10000	4.00
		1000	18	18			1000	8		
	5	100	112	112	11000	4.04	100	127	12000	4.08
		1000	11	11			1000	8		
	1	1000	143	143	140000	5.15	1000	142	150000	5.18
		10000	16	16			10000	18		
	6	10000	22	22	240000	5.38	10000	19	180000	5.26
		100000	4	4			100000	1		
N	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	15	15	1400	3.15	100	18	1800	3.26
		1000	0	0			1000	2		
	7	100	17	17	1700	3.23	100	19	1800	3.26
		1000	2	2			1000	1		
	2	100	146	146	15000	4.18	100	136	14000	4.15
		1000	14	14			1000	15		
	5	100	127	127	13000	4.11	1000	21	22000	4.34
		1000	13	13			10000	3		
	1	1000	146	146	140000	5.15	1000	150	150000	5.18
		10000	12	12			10000	13		
	6	1000	99	99	98000	4.99	1000	149	140000	5.15
		10000	9	9			10000	10		
O	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	100	13	13	1200	3.08	100	13	1200	3.08
		1000	0	0			1000	0		
	7	10	153	153	1500	3.18	100	20	1900	3.28
		1000	17	17			1000	1		
	2	100	118	118	12000	4.08	100	128	13000	4.11
		1000	9	9			1000	13		
	5	100	121	121	12000	4.08	100	128	13000	4.11
		1000	13	13			1000	13		
	1	10000	22	22	220000	5.34	10000	12	120000	5.08
		100000	2	2			100000	1		
	6	1000	131	131	130000	5.11	1000	127	130000	5.11
		10000	15	15			10000	11		

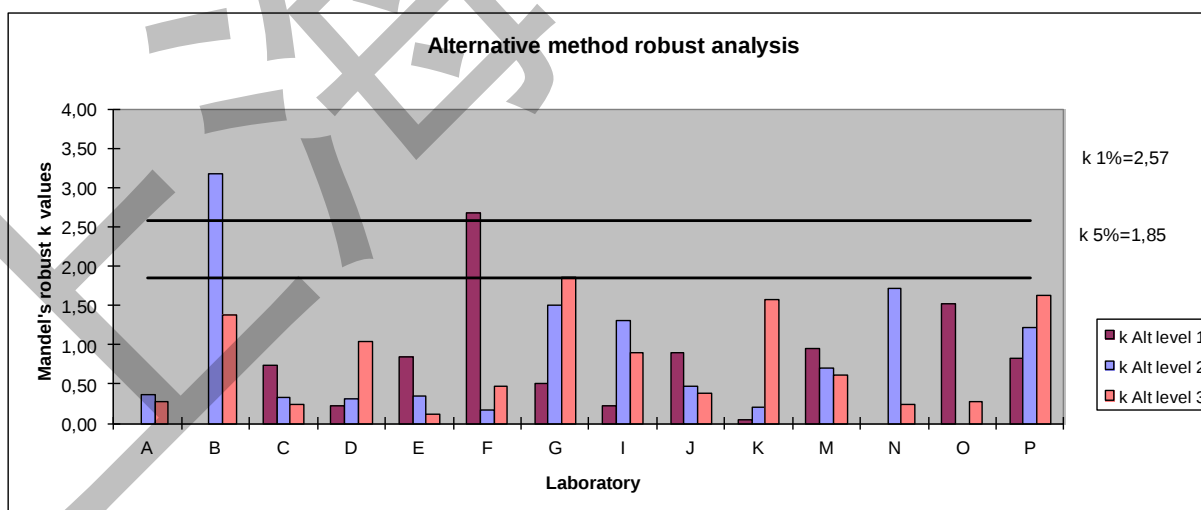
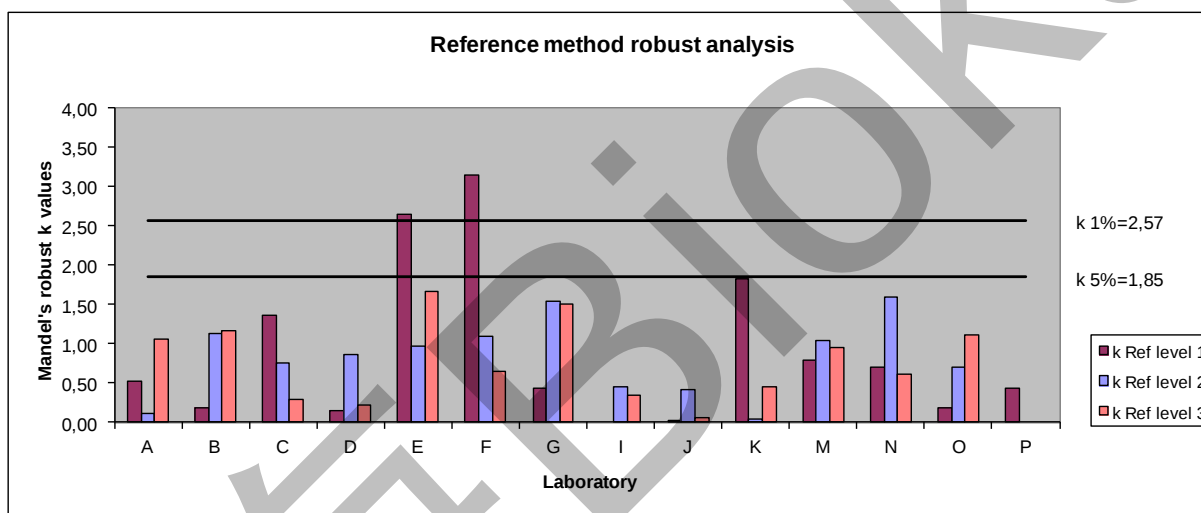
Laboratory	No. Spl.	ISO XP/TS 11059 reference method					RHAPSODY Agar method			
		Dilution	CFU/plate	CFU/confirmed	CFU/g	Log (CFU/g)	Dilution	CFU/plate	CFU/g	Log (CFU/g)
P	3	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	8	10	0	0	<10	<1.00	10	0	<10	<1.00
		100	0	0			100	0		
	4	10	116	116	1200	3.08	100	13	1400	3.15
		100	15	15			1000	2		
	7	10	143	143	1400	3.15	100	20	1800	3.26
		100	9	9			1000	0		
	2	100	126	126	13000	4.11	100	82	8000	3.90
		1000	12	12			1000	6		
	5	100	137	137	13000	4.11	100	106	11000	4.04
		1000	10	10			1000	14		
	1	10000	30	30	300000	5.48	10000	20	210000	5.32
		100000	3	3			100000	3		
	6	1000	134	134	140000	5.15	1000	130	130000	5.11
		10000	19	19			10000	12		

Appendix 12 – Mandel plots (NF ISO 13720 reference method)

Laboratory	h Ref level 1	h Ref level 2	h Ref level 3	h Alt level 1	h Alt level 2	h Alt level 3	h5%	h1%	h5%	h1%
A	0.55	-0.66	0.08	-0.45	0.38	0.13	1.97	2.83	-1.97	-2.83
B	-1.46	-2.72	-4.62	-2.05	-6.10	-6.26	1.97	2.83	-1.97	-2.83
C	-1.05	-0.86	-0.53	0.74	0.67	0.53	1.97	2.83	-1.97	-2.83
D	-0.09	0.02	0.05	-0.05	0.93	0.86	1.97	2.83	-1.97	-2.83
E	2.26	0.48	0.78	-1.23	-0.55	-0.89	1.97	2.83	-1.97	-2.83
F	1.24	-0.60	-0.62	-1.43	-1.08	-1.12	1.97	2.83	-1.97	-2.83
G	-0.03	0.68	0.43	-0.47	-0.10	-0.31	1.97	2.83	-1.97	-2.83
I	0.61	-0.02	-0.05	0.20	-0.02	-0.13	1.97	2.83	-1.97	-2.83
J	-0.56	-1.24	-1.40	0.05	-0.10	-1.09	1.97	2.83	-1.97	-2.83
K	-1.64	-0.84	-0.86	-2.91	-0.78	-0.20	1.97	2.83	-1.97	-2.83
M	0.36	1.19	1.95	0.62	0.52	0.88	1.97	2.83	-1.97	-2.83
N	0.03	0.26	-0.59	0.76	2.02	0.53	1.97	2.83	-1.97	-2.83
O	0.44	0.57	0.35	0.11	1.06	0.13	1.97	2.83	-1.97	-2.83
P	-0.03	0.14	0.21	0.29	0.02	0.89	1.97	2.83	-1.97	-2.83



Laboratory	k Ref level 1	k Ref level 2	k Ref level 3	k5%	K1%	k Alt level 1	k Alt level 2	k Alt level 3
A	0.53	0.12	1.06	1.85	2.57	0.00	0.36	0.27
B	0.19	1.14	1.17	1.85	2.57	0.00	3.18	1.38
C	1.37	0.76	0.29	1.85	2.57	0.74	0.33	0.23
D	0.16	0.86	0.22	1.85	2.57	0.23	0.30	1.04
E	2.64	0.97	1.67	1.85	2.57	0.85	0.34	0.12
F	3.16	1.11	0.65	1.85	2.57	2.67	0.17	0.47
G	0.43	1.54	1.51	1.85	2.57	0.51	1.51	1.86
I	0.00	0.46	0.34	1.85	2.57	0.21	1.31	0.89
J	0.04	0.42	0.06	1.85	2.57	0.89	0.46	0.38
K	1.83	0.04	0.45	1.85	2.57	0.05	0.21	1.58
M	0.80	1.05	0.95	1.85	2.57	0.95	0.69	0.62
N	0.71	1.60	0.61	1.85	2.57	0.00	1.72	0.23
O	0.19	0.70	1.12	1.85	2.57	1.52	0.00	0.27
P	0.43	0.00	0.00	1.85	2.57	0.83	1.21	1.63



Appendix 13 – Statistical interpretations (NF ISO 13720 reference method)

Level 1											
Laboratories number (p)			14								
Laboratories	Level 1		Mean	si	Deviation		h values	k values			
	Ref										
A	3,204	3,114	3,159	0,06	0,045	-0,045	0,546	0,533			
B	2,633	2,602	2,618	0,02	0,016	-0,016	-1,464	0,186			
C	2,845	2,613	2,729	0,16	0,116	-0,116	-1,051	1,374			
D	3,000	2,973	2,987	0,02	0,013	-0,013	-0,095	0,159			
E	3,398	3,845	3,622	0,32	-0,224	0,224	2,263	2,644			
F	3,079	3,613	3,346	0,38	-0,267	0,267	1,240	3,155			
G	3,041	2,968	3,005	0,05	0,036	-0,036	-0,026	0,431			
I	3,176	3,176	3,176	0,00	0,000	0,000	0,609	0,000			
J	2,857	2,863	2,860	0,00	-0,003	0,003	-0,563	0,035			
K	2,724	2,415	2,570	0,22	0,155	-0,155	-1,643	1,829			
M	3,176	3,041	3,109	0,10	0,067	-0,067	0,359	0,796			
N	3,079	2,959	3,019	0,08	0,060	-0,060	0,026	0,710			
O	3,114	3,146	3,130	0,02	-0,016	0,016	0,438	0,190			
P	2,968	3,041	3,005	0,05	-0,036	0,036	-0,026	0,431			

m			3,01202457								
n=2*p	Cn(2p)	1,956									
	Cn(p)	1,7476									
	n	28									
	f	15									
	l	105									
n=p	n	14									
	f	8									
	l	28									
	Qn(2p)	0,043222									
	Qn(p)	0,1540939									
Qwithin		0,08456									
Qbetween		0,26929									
Sr(repaetability standard deviation)		0,1196									
RSDr(variation coefficient of repeatability)		3,97%									
r(repeatability limit)		0,3348									
SL ² (between laboratories standard deviation)		0,06537									
SR(reproducibility standard deviation)		0,2823									
RSDR(variation coefficient of reproducibility)		0,094									
R(reproducibility limit)		0,7903									

Laborabries	Level 1		Mean	si	Deviation		h values	k values	D
	Alt								
A	3,114	3,114	3,114	0,00	0,000	0,000	-0,455	0,000	-0,045
B	2,929	2,929	2,929	0,00	0,000	0,000	-2,047	0,000	0,312
C	3,301	3,204	3,253	0,07	0,048	-0,048	0,741	0,740	0,524
D	3,146	3,176	3,161	0,02	-0,015	0,015	-0,048	0,229	0,175
E	2,968	3,079	3,024	0,08	-0,055	0,055	-1,232	0,845	-0,598
F	3,176	2,826	3,001	0,25	0,175	-0,175	-1,429	2,672	-0,345
G	3,146	3,079	3,113	0,05	0,033	-0,033	-0,466	0,511	0,108
I	3,204	3,176	3,190	0,02	0,014	-0,014	0,202	0,214	0,014
J	3,114	3,230	3,172	0,08	-0,058	0,058	0,048	0,890	0,312
K	2,826	2,833	2,829	0,00	-0,003	0,003	-2,911	0,049	0,260
M	3,176	3,301	3,239	0,09	-0,062	0,062	0,621	0,954	0,130
N	3,255	3,255	3,255	0,00	0,000	0,000	0,765	0,000	0,236
O	3,079	3,279	3,179	0,14	-0,100	0,100	0,106	1,524	0,049
P	3,146	3,255	3,201	0,08	-0,055	0,055	0,294	0,833	0,196

m			3,16665									Accuracy	
n=2*p	Cn(2p)	1,956										median D	0,1522
	Cn(p)	1,7476										Cp	1,7476
	n	28										Qn(D)	0,137323
	f	15										Qdiff	0,23997997
	l	105										t	1,89
n=p	n	14											
	f	8											
	l	28											
	Qn(2p)	0,033473											
	Qn(p)	0,0663128											
Qwithin		0,06549											
Qbetween		0,11589											
Sr		0,0926											
RSDr		2,92%											
r		0,2593											
SL ²		0,00914											
SR		0,1331											
RSDR		0,042											
R		0,3727											

Level 2

Laboratories number (p)

14

Laboratories	Level 2		Mean	si	Deviation		h values	k values
	Ref							
A	3,892	3,875	3,884	0,01	0,009	-0,009	-0,661	0,123
B	3,398	3,556	3,477	0,11	-0,079	0,079	-2,715	1,140
C	3,898	3,792	3,845	0,07	0,053	-0,053	-0,856	0,757
D	4,079	3,959	4,019	0,08	0,060	-0,060	0,024	0,865
E	4,176	4,041	4,109	0,10	0,067	-0,067	0,477	0,969
F	3,820	3,973	3,896	0,11	-0,077	0,077	-0,596	1,105
G	4,041	4,255	4,148	0,15	-0,107	0,107	0,677	1,539
I	4,041	3,978	4,010	0,05	0,032	-0,032	-0,024	0,458
J	3,799	3,740	3,770	0,04	0,029	-0,029	-1,236	0,424
K	3,851	3,845	3,848	0,00	0,003	-0,003	-0,840	0,044
M	4,322	4,176	4,249	0,10	0,073	-0,073	1,187	1,052
N	4,176	3,954	4,065	0,16	0,111	-0,111	0,257	1,596
O	4,079	4,176	4,128	0,07	-0,048	0,048	0,573	0,697
P	4,041	4,041	4,041	0,00	0,000	0,000	0,137	0,000

Laboratories	Level 2		Mean	si	Deviation		h values	k values	D
	Alt								
A	4,000	4,041	4,021	0,03	-0,021	0,021	0,377	0,363	0,14
B	3,322	2,959	3,141	0,26	0,182	-0,182	-6,096	3,182	-0,34
C	4,079	4,041	4,060	0,03	0,019	-0,019	0,668	0,331	0,22
D	4,114	4,079	4,097	0,02	0,017	-0,017	0,935	0,305	0,08
E	3,914	3,875	3,894	0,03	0,019	-0,019	-0,552	0,339	-0,21
F	3,833	3,813	3,823	0,01	0,010	-0,010	-1,080	0,172	-0,07
G	3,869	4,041	3,955	0,12	-0,086	0,086	-0,104	1,508	-0,19
I	3,892	4,041	3,967	0,11	-0,075	0,075	-0,020	1,308	-0,04
J	3,982	3,929	3,956	0,04	0,026	-0,026	-0,100	0,463	0,19
K	3,875	3,851	3,863	0,02	0,012	-0,012	-0,782	0,209	0,01
M	4,000	4,079	4,040	0,06	-0,040	0,040	0,516	0,694	-0,21
N	4,146	4,342	4,244	0,14	-0,098	0,098	2,021	1,720	0,18
O	4,114	4,114	4,114	0,00	0,000	0,000	1,062	0,000	-0,01
P	3,903	4,041	3,972	0,10	-0,069	0,069	0,020	1,212	-0,07

m	4,01433473
Cn(28)	1,956
Cn(14)	1,7476
n	28
f	15
l	105
n=p	14
f	8
l	28
Qn(28)	0,035515
Qn(14)	0,1132223
Qwithin	0,06948
Qbetween	0,19786
Sr(repeatability standard deviation)	0,0983
RSDr(variation coefficient of repeatability)	2,45%
r(repeatability limit)	0,2751
SL ² (between laboratories standard deviation)	0,03432
SR(reproducibility standard deviation)	0,2097
RSDR(variation coefficient of reproducibility)	0,052
R(reproducibility limit)	0,5872

m	3,96949	Accuracy
Cn(28)	1,956	median D -0,0283
Cn(14)	1,7476	Cp 1,7476
n	28	Qn(D) 0,122186
f	15	Qdiff 0,21352845
l	105	t 0,40
n=p	14	
f	8	
l	28	
Qn(28)	0,029174	
Qn(14)	0,0778038	
Qwithin	0,05708	
Qbetween	0,13597	
Sr	0,0807	
RSDr	2,03%	
r	0,2260	
SL ²	0,01523	
SR	0,1475	
RSDR	0,037	
R	0,4129	

Level 3

Laboratories number (p)

14

Laboratories	Level 3		Mean	si	Deviation		h values	k values
	Ref							
A	5,000	5,301	5,151	0,21	-0,151	0,151	0,077	1,056
B	4,447	4,114	4,281	0,24	0,167	-0,167	-4,622	1,169
C	4,996	5,079	5,037	0,06	-0,042	0,042	-0,534	0,293
D	5,114	5,176	5,145	0,04	-0,031	0,031	0,047	0,218
E	5,519	5,041	5,280	0,34	0,239	-0,239	0,776	1,674
F	4,929	5,114	5,022	0,13	-0,092	0,092	-0,619	0,647
G	5,431	5,000	5,216	0,31	0,216	-0,216	0,429	1,513
I	5,079	5,176	5,128	0,07	-0,048	0,048	-0,047	0,340
J	4,869	4,886	4,878	0,01	-0,009	0,009	-1,396	0,061
K	5,041	4,914	4,978	0,09	0,064	-0,064	-0,857	0,448
M	5,362	5,633	5,498	0,19	-0,136	0,136	1,951	0,953
N	4,940	5,114	5,027	0,12	-0,087	0,087	-0,592	0,612
O	5,362	5,041	5,202	0,23	0,160	-0,160	0,352	1,124
P	5,176	5,176	5,176	0,00	0,000	0,000	0,215	0,000

Laborabries	Level 3		Mean	si	Deviation		h values	k values	D
	Alt								
A	5,114	5,079	5,097	0,02	0,017	-0,017	0,125	0,272	-0,054
B	4,176	4,000	4,088	0,12	0,088	-0,088	-6,262	1,378	-0,193
C	5,146	5,176	5,161	0,02	-0,015	0,015	0,534	0,234	0,124
D	5,146	5,279	5,212	0,09	-0,066	0,066	0,859	1,038	0,067
E	4,929	4,944	4,937	0,01	-0,008	0,008	-0,885	0,118	-0,343
F	4,929	4,869	4,899	0,04	0,030	-0,030	-1,124	0,471	-0,122
G	5,146	4,908	5,027	0,17	0,119	-0,119	-0,313	1,859	-0,188
I	5,000	5,114	5,057	0,08	-0,057	0,057	-0,125	0,891	-0,071
J	4,881	4,929	4,905	0,03	-0,024	0,024	-1,087	0,380	0,027
K	4,944	5,146	5,045	0,14	-0,101	0,101	-0,199	1,577	0,068
M	5,176	5,255	5,216	0,06	-0,040	0,040	0,880	0,619	-0,282
N	5,176	5,146	5,161	0,02	0,015	-0,015	0,534	0,234	0,134
O	5,079	5,114	5,097	0,02	-0,017	0,017	0,125	0,272	-0,105
P	5,322	5,114	5,218	0,15	0,104	-0,104	0,895	1,629	0,042

m 5,13632678

m 5,07677

Accuracy

n=2*p

Cn(2p)	1,956
Cn(p)	1,7476
n	28
f	15
l	105

n=2*p

Cn(2p)	1,956
Cn(p)	1,7476
n	28
f	15
l	105

median D -0,0623
Cp 1,7476
Qn(D) 0,093541
Qdiff 0,16346852
t 1,14

n=p

n	14
f	8
l	28
Qn(2p)	0,072847
Qn(p)	0,1059551
Qwithin	0,14252
Qbetween	0,18516

n=p

n	14
f	8
l	28
Qn(2p)	0,032669
Qn(p)	0,0903557
Qwithin	0,06391
Qbetween	0,15790

Sr(repeatability standard deviation) 0,2015
RSDr(variation coefficient of repeatability) 3,92%
r(repeatability limit) 0,5643

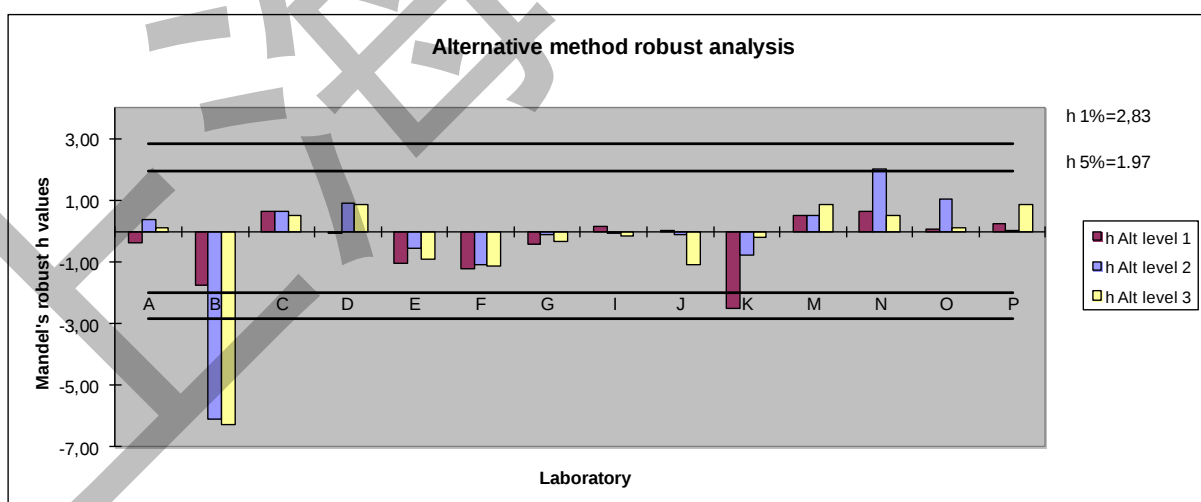
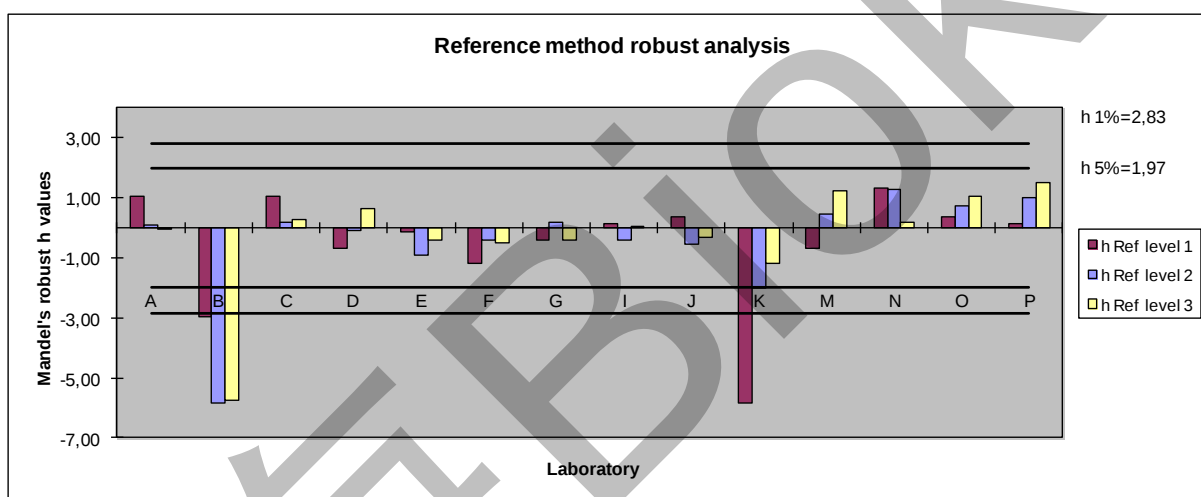
Sr 0,0904
RSDr 1,78%
r 0,2531

SL²(between laboratories standard deviation) 0,01397
SR(reproducibility standard deviation) 0,2337
RSDR(variation coefficient of reproducibility) 0,045
R(reproducibility limit) 0,6542

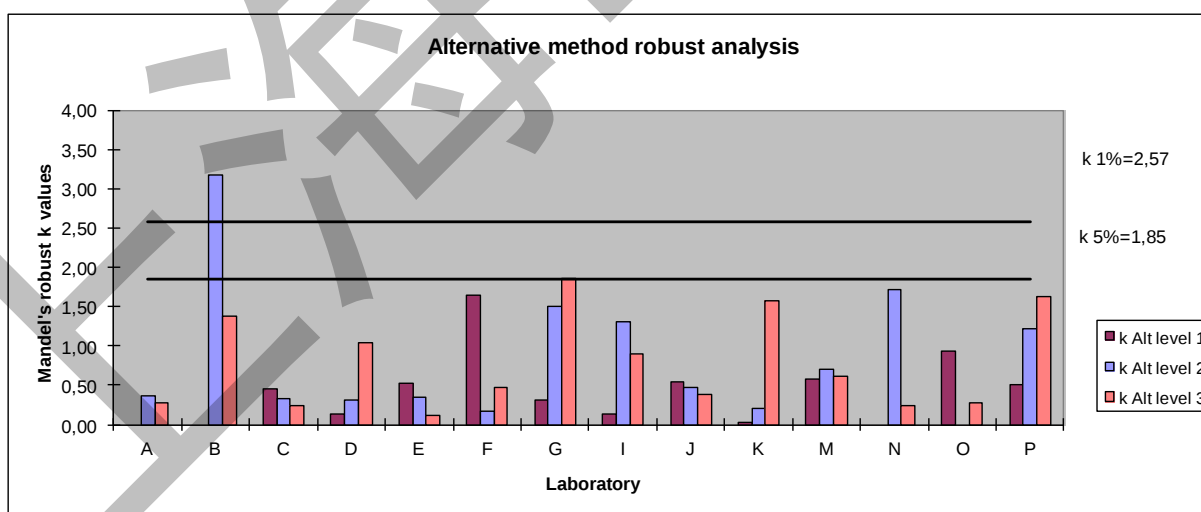
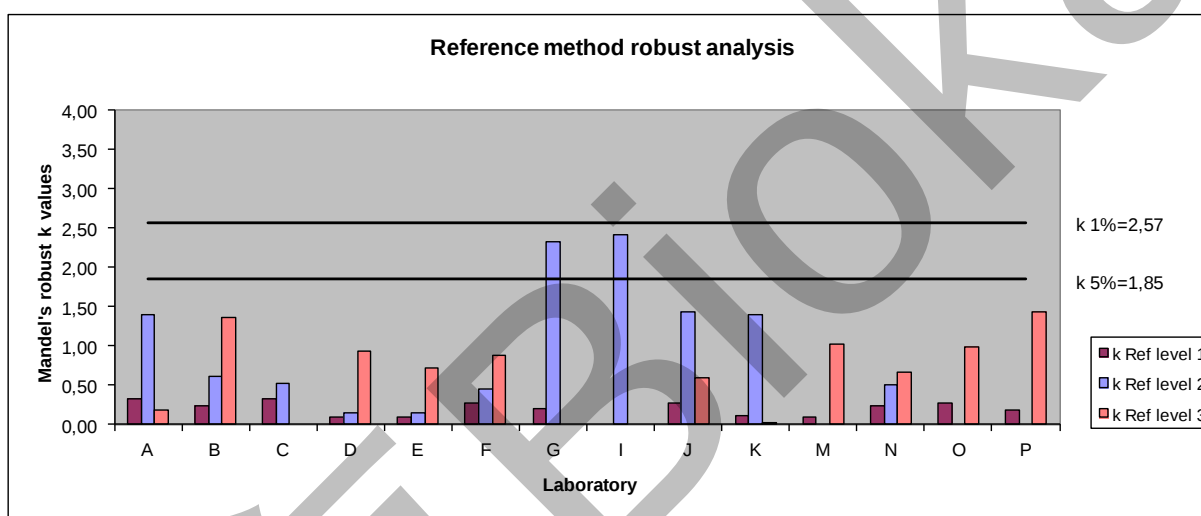
SL² 0,02085
SR 0,1703
RSDR 0,034
R 0,4770

Appendix 14 – Mandel plots (ISO XP/TS 11059 reference method)

Laboratory	h Ref level 1	h Ref level 2	h Ref level 3	h Alt level 1	h Alt level 2	h Alt level 3	h5%	h1%	h5%	h1%
A	1.07	0.08	-0.06	-0.39	0.38	0.13	1.97	2.83	-1.97	-2.83
B	-2.96	-5.85	-5.75	-1.75	-6.10	-6.26	1.97	2.83	-1.97	-2.83
C	1.07	0.21	0.26	0.63	0.67	0.53	1.97	2.83	-1.97	-2.83
D	-0.70	-0.08	0.63	-0.04	0.93	0.86	1.97	2.83	-1.97	-2.83
E	-0.13	-0.92	-0.39	-1.06	-0.55	-0.89	1.97	2.83	-1.97	-2.83
F	-1.17	-0.41	-0.49	-1.22	-1.08	-1.12	1.97	2.83	-1.97	-2.83
G	-0.42	0.17	-0.41	-0.40	-0.10	-0.31	1.97	2.83	-1.97	-2.83
I	0.15	-0.40	0.06	0.17	-0.02	-0.13	1.97	2.83	-1.97	-2.83
J	0.36	-0.56	-0.31	0.04	-0.10	-1.09	1.97	2.83	-1.97	-2.83
K	-5.82	-2.01	-1.19	-2.49	-0.78	-0.20	1.97	2.83	-1.97	-2.83
M	-0.70	0.46	1.24	0.53	0.52	0.88	1.97	2.83	-1.97	-2.83
N	1.32	1.27	0.20	0.65	2.02	0.53	1.97	2.83	-1.97	-2.83
O	0.36	0.76	1.05	0.09	1.06	0.13	1.97	2.83	-1.97	-2.83
P	0.13	1.03	1.50	0.25	0.02	0.89	1.97	2.83	-1.97	-2.83



Laboratory	k Ref level 1	k Ref level 2	k Ref level 3	k5%	K1%	k Alt level 1	k Alt level 2	k Alt level 3
A	0.32	1.40	0.18	1.85	2.57	0.00	0.36	0.27
B	0.23	0.61	1.37	1.85	2.57	0.00	3.18	1.38
C	0.32	0.52	0.00	1.85	2.57	0.45	0.33	0.23
D	0.11	0.15	0.93	1.85	2.57	0.14	0.30	1.04
E	0.10	0.15	0.73	1.85	2.57	0.52	0.34	0.12
F	0.27	0.46	0.88	1.85	2.57	1.64	0.17	0.47
G	0.20	2.33	0.00	1.85	2.57	0.31	1.51	1.86
I	0.00	2.42	0.00	1.85	2.57	0.13	1.31	0.89
J	0.27	1.43	0.60	1.85	2.57	0.55	0.46	0.38
K	0.11	1.39	0.03	1.85	2.57	0.03	0.21	1.58
M	0.11	0.00	1.02	1.85	2.57	0.59	0.69	0.62
N	0.23	0.51	0.68	1.85	2.57	0.00	1.72	0.23
O	0.27	0.00	1.00	1.85	2.57	0.93	0.00	0.27
P	0.19	0.00	1.44	1.85	2.57	0.51	1.21	1.63



Appendix 15 – Statistical interpretations (ISO XP/TS 11059 reference method)

Level 1

Laboratories number (p)

14

Laboratories	Level 1		Mean	si	Deviation		h values	k values
	Ref							
A	3,114	3,230	3,172	0,08	-0,058	0,058	1,066	0,325
B	2,959	2,875	2,917	0,06	0,042	-0,042	-2,959	0,234
C	3,114	3,230	3,172	0,08	-0,058	0,058	1,066	0,325
D	3,041	3,079	3,060	0,03	-0,019	0,019	-0,699	0,105
E	3,114	3,079	3,097	0,02	0,017	-0,017	-0,127	0,097
F	3,079	2,982	3,031	0,07	0,048	-0,048	-1,165	0,270
G	3,114	3,041	3,078	0,05	0,036	-0,036	-0,425	0,202
I	3,114	3,114	3,114	0,00	0,000	0,000	0,147	0,000
J	3,176	3,079	3,128	0,07	0,048	-0,048	0,363	0,270
K	2,756	2,716	2,736	0,03	0,020	-0,020	-5,816	0,111
M	3,079	3,041	3,060	0,03	0,019	-0,019	-0,699	0,105
N	3,146	3,230	3,188	0,06	-0,042	0,042	1,320	0,235
O	3,079	3,176	3,128	0,07	-0,048	0,048	0,363	0,270
P	3,079	3,146	3,113	0,05	-0,033	0,033	0,127	0,187

m

3,10460847

n=2*p

Cn(2p)

1,956

Cn(p)

1,7476

n

28

f

15

l

105

n=p

n

14

f

8

l

28

Qn(2p)

0,091726

Qn(p)

0,0362753

Qwithin

0,17945

Qbetween

0,06339

Sr(repaetability standard deviation)

0,2538

RSDr(variation coefficient of repeatability)

8,17%

r(repeatability limit)

0,7106

SL²(between laboratories standard deviation)

-0,02818

SR(reproducibility standard deviation)

0,2538

RSDR(variation coefficient of reproducibility)

0,082

R(reproducibility limit)

0,7106

SL<0 SR=SR

Laboratories	Level 1		Mean	si	Deviation		h values	k values	D
	Alt								
A	3,114	3,114	3,114	0,00	0,000	0,000	-0,389	0,000	-0,058
B	2,929	2,929	2,929	0,00	0,000	0,000	-1,753	0,000	0,012
C	3,301	3,204	3,253	0,07	0,048	-0,048	0,635	0,454	0,080
D	3,146	3,176	3,161	0,02	-0,015	0,015	-0,041	0,140	0,101
E	2,968	3,079	3,024	0,08	-0,055	0,055	-1,055	0,518	-0,073
F	3,176	2,826	3,001	0,25	0,175	-0,175	-1,223	1,639	-0,030
G	3,146	3,079	3,113	0,05	0,033	-0,033	-0,399	0,314	0,035
I	3,204	3,176	3,190	0,02	0,014	-0,014	0,173	0,131	0,076
J	3,114	3,230	3,172	0,08	-0,058	0,058	0,041	0,546	0,045
K	2,826	2,833	2,829	0,00	-0,003	0,003	-2,493	0,030	0,093
M	3,176	3,301	3,239	0,09	-0,062	0,062	0,531	0,585	0,178
N	3,255	3,255	3,255	0,00	0,000	0,000	0,655	0,000	0,067
O	3,079	3,279	3,179	0,14	-0,100	0,100	0,091	0,935	0,051
P	3,146	3,255	3,201	0,08	-0,055	0,055	0,252	0,511	0,088

m

3,16665

n=2*p

Cn(2p)

1,956

Cn(p)

1,7476

n

28

f

15

l

105

n=p

n

14

f

8

l

28

Qn(2p)

0,054572

Qn(p)

0,0774510

Qwithin

0,10676

Qbetween

0,13535

Sr

0,1510

RSDr

4,77%

r

0,4228

SL²

0,00692

SR

0,1724

RSDR

0,054

R

0,4827

Accuracy

median D

0,0592

Cp

1,7476

Qn(D)

0,041176

Qdiff

0,071956987

t

2,46

Level 2

Laboratories number (p)

14

Laboratories	Level 2		Mean	si	Deviation		h values	k values
	Ref							
A	3,908	4,079	3,994	0,12	-0,085	0,085	0,082	1,404
B	3,279	3,204	3,241	0,05	0,037	-0,037	-5,852	0,614
C	4,041	3,978	4,010	0,05	0,032	-0,032	0,206	0,524
D	3,964	3,982	3,973	0,01	-0,009	0,009	-0,082	0,152
E	3,875	3,857	3,866	0,01	0,009	-0,009	-0,925	0,146
F	3,903	3,959	3,931	0,04	-0,028	0,028	-0,413	0,460
G	3,863	4,146	4,005	0,20	-0,141	0,141	0,168	2,326
I	3,785	4,079	3,932	0,21	-0,147	0,147	-0,404	2,417
J	4,000	3,826	3,913	0,12	0,087	-0,087	-0,555	1,430
K	3,813	3,643	3,728	0,12	0,085	-0,085	-2,013	1,394
M	4,041	4,041	4,041	0,00	0,000	0,000	0,457	0,000
N	4,176	4,114	4,145	0,04	0,031	-0,031	1,274	0,511
O	4,079	4,079	4,079	0,00	0,000	0,000	0,755	0,000
P	4,114	4,114	4,114	0,00	0,000	0,000	1,029	0,000

Laboratories	Level 2		Mean	si	Deviation		h values	k values	D
	Alt								
A	4,000	4,041	4,021	0,03	-0,021	0,021	0,377	0,363	0,03
B	3,322	2,959	3,141	0,26	0,182	-0,182	-6,096	3,182	-0,10
C	4,079	4,041	4,060	0,03	0,019	-0,019	0,668	0,331	0,05
D	4,114	4,079	4,097	0,02	0,017	-0,017	0,935	0,305	0,12
E	3,914	3,875	3,894	0,03	0,019	-0,019	-0,552	0,339	0,03
F	3,833	3,813	3,823	0,01	0,010	-0,010	-1,080	0,172	-0,11
G	3,869	4,041	3,955	0,12	-0,086	0,086	-0,104	1,508	-0,05
I	3,892	4,041	3,967	0,11	-0,075	0,075	-0,020	1,308	0,03
J	3,982	3,929	3,956	0,04	0,026	-0,026	-0,100	0,463	0,04
K	3,875	3,851	3,863	0,02	0,012	-0,012	-0,782	0,209	0,13
M	4,000	4,079	4,040	0,06	-0,040	0,040	0,516	0,694	0,00
N	4,146	4,342	4,244	0,14	-0,098	0,098	2,021	1,720	0,10
O	4,114	4,114	4,114	0,00	0,000	0,000	1,062	0,000	0,03
P	3,903	4,041	3,972	0,10	-0,069	0,069	0,020	1,212	-0,14

m

3,98343133

m

3,96949

Accuracy

median D 0,0314

Cp 1,7476

Qn(D) 0,058941

Qdiff 0,10300358

t 0,91

n=2*p

Cn(28)

1,956

Cn(14)

1,7476

n

28

f

15

l

105

n=p

n

14

f

8

l

28

Qn(28)

0,031074

Qn(14)

0,0725507

Qwithin

0,06079

Qbetween

0,12679

Sr(repeatability standard deviation)

0,0860

RSDr(variation coefficient of repeatability)

2,16%

r(repeatability limit)

0,2407

SL²(between laboratories standard deviation)

0,01238

SR(reproducibility standard deviation)

0,1406

RSDR(variation coefficient of reproducibility)

0,035

R(reproducibility limit)

0,3937

n=2*p

Cn(28)

1,956

Cn(14)

1,7476

n

28

f

15

l

105

n=p

n

14

f

8

l

28

Qn(28)

0,029174

Qn(14)

0,0778038

Qwithin

0,05708

Qbetween

0,13597

Sr

0,0807

RSDr

2,03%

r

0,2260

SL²

0,01523

SR

0,1475

RSDR

0,037

R

0,4129

Level 3

Laboratories number (p)

14

Laboratoires	Level 3		Mean	si	Deviation		h values	k values
	Ref							
A	5,041	5,000	5,021	0,03	0,021	-0,021	-0,055	0,181
B	3,799	4,114	3,957	0,22	-0,157	0,157	-5,749	1,373
C	5,079	5,079	5,079	0,00	0,000	0,000	0,258	0,000
D	5,041	5,255	5,148	0,15	-0,107	0,107	0,628	0,933
E	4,875	5,041	4,958	0,12	-0,083	0,083	-0,390	0,726
F	4,839	5,041	4,940	0,14	-0,101	0,101	-0,487	0,884
G	4,954	4,954	4,954	0,00	0,000	0,000	-0,411	0,000
I	5,041	5,041	5,041	0,00	0,000	0,000	0,055	0,000
J	5,041	4,903	4,972	0,10	0,069	-0,069	-0,315	0,604
K	4,813	4,806	4,810	0,00	0,003	-0,003	-1,185	0,029
M	5,146	5,380	5,263	0,17	-0,117	0,117	1,242	1,022
N	5,146	4,991	5,069	0,11	0,077	-0,077	0,201	0,676
O	5,342	5,114	5,228	0,16	0,114	-0,114	1,055	0,997
P	5,477	5,146	5,312	0,23	0,165	-0,165	1,501	1,445

m

5,03104451

n=2*p

Cn(2p)
Cn(p)
n
f
l1,956
1,7476
28
15
105

n=p

n
f
l
Qn(2p)
Qn(p)
Qwithin
Qbetween14
8
28
0,058557
0,1069399
0,11456
0,18688Sr(repeatability standard deviation)
RSDr(variation coefficient of repeatability)
r(repeatability limit)0,1620
3,22%
0,4536SL²(between laboratories standard deviation)
SR(reproducibility standard deviation)
RSDR(variation coefficient of reproducibility)
R(reproducibility limit)0,02180
0,2192
0,044
0,6138

Laboratoires	Level 3		Mean	si	Deviation		h values	k values	D
	Alt								
A	5,114	5,079	5,097	0,02	0,017	-0,017	0,125	0,272	0,076
B	4,176	4,000	4,088	0,12	0,088	-0,088	-6,262	1,378	0,131
C	5,146	5,176	5,161	0,02	-0,015	0,015	0,534	0,234	0,082
D	5,146	5,279	5,212	0,09	-0,066	0,066	0,859	1,038	0,064
E	4,929	4,944	4,937	0,01	-0,008	0,008	-0,885	0,118	-0,021
F	4,929	4,869	4,899	0,04	0,030	-0,030	-1,124	0,471	-0,041
G	5,146	4,908	5,027	0,17	0,119	-0,119	-0,313	1,859	0,073
I	5,000	5,114	5,057	0,08	-0,057	0,057	-0,125	0,891	0,016
J	4,881	4,929	4,905	0,03	-0,024	0,024	-1,087	0,380	-0,067
K	4,944	5,146	5,045	0,14	-0,101	0,101	-0,199	1,577	0,236
M	5,176	5,255	5,216	0,06	-0,040	0,040	0,880	0,619	-0,047
N	5,176	5,146	5,161	0,02	0,015	-0,015	0,534	0,234	0,092
O	5,079	5,114	5,097	0,02	-0,017	0,017	0,125	0,272	-0,132
P	5,322	5,114	5,218	0,15	0,104	-0,104	0,895	1,629	-0,094

m

5,07677

n=2*p

Cn(2p)
Cn(p)
n
f
l1,956
1,7476
28
15
105

n=p

n
f
l
Qn(2p)
Qn(p)
Qwithin
Qbetween14
8
28
0,032669
0,0903557
0,06391
0,15790Sr
RSDr
r0,0904
1,78%
0,2531SL²
SR
RSDR
R0,02085
0,1703
0,034
0,4770

Accuracy

median D 0,0398
Cp 1,7476
Qn(D) 0,055538
Qdiff 0,0970556
t 1,23