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AFNOR VALIDATION Certification of the RayAl Listeria method for the detection of *Listeria* spp.

Comparative and interlaboratory studies according to the EN ISO 16140 standard

Certificate number: RAY 32/03 – 07/10

SUMMARY REPORT

Validation date :	01/07/2010
End validation date :	01/07/2014

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Contents

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1 Introduction

1.1 Validation references

The RayAL *Listeria* method has been validated in July 2010 according to the reference method EN ISO 16140 : 2003, with respect to the reference method EN ISO 11290-1/A1:2004 (#), for all human food products and for environmental samples.

1.2 Protocol and principle of the alternative method

1.2.1 Protocol

The diagram summarising the method is shown in appendix A.

The different analytical steps are the following:

- Pre-enrichment
  22-26 hours at 30℃ ±1℃ in Half-Fraser both (1/10)

- Enrichment
  Transfer of 0.2ml of ½ Fraser broth in 10ml RayAl Enrichment for Listeria Medium broth (RELM), incubated 22-26 hours at 30℃ ±1℃

- ELISA test
  From a 1ml RELM aliquot, after heating for 15-20 minutes at 85-100℃.

- Confirmations

Positive results with RayAl Listeria tests must be confirmed by streaking the unheated RELM (preserved at 30℃, if ELISA test is realized within 2 hours following the end of incubation or at 2- 8℃ for the upper deadl ine) on *Listeria* selective agar by one of the following means :

- According to classical tests described in the methods standardized by CEN or ISO,

or

- Alternatively, it is possible to perform confirmation tests directly if the colonies are well isolated *(*realization of Gram and catalase tests for genus *Listeria* confirmation).
  If a confirmation of the species is wished, a gallery of identification can be realized, without preliminary purification if the colony is enough isolated.

If discrepant results are obtained (positive with the alternative method, not confirmed with the tests described in the methods standardized), the laboratory must take the necessary steps to ensure that results obtained are accurate.

**In the context of AFNOR VALIDATION certification, test portion superior to 25 g were not tested.*

Furthermore, assays were made on positive samples tested during the accuracy test to evaluate the possibility of keeping the RELM broth for 72 hours at 2℃-8℃ afte r incubation and before ELISA test to verify that this conservation does not modify the result.

1.2.2 Principle of the RayAL **Listeria** *method*

RayAl Listeria test is a two-step, sandwich-type ELISA (Enzyme Linked Immuno Sorbent Assay) using a microtitre plate coated with specific antibodies directed against *Listeria* antigens, and ready-to-use reagents.
The test allows the detection of *Listeria* spp. after enrichment steps and a heat shock releasing *Listeria* antigens that can be eventually present in the sample.
The reading of the micro plate is done with a spectrophotometer at an optical density (OD) of 450nm.

⇨ Validation of the test, only if:
- OD_{450nm} *of positive control (PC) is greater than or equal to 0.500.*
- OD_{450nm} *of negative control (TN) is lower, or equal at 0.150.*

Positive tests (DO > 0.200) with RayAl Listeria tests have to be confirmed by streaking the non-heated RELM on selective agar.

Note: RayAl Listeria can be performed on DSX or DS2 instruments.

1.3 Application scope

All human food products and environmental samples.

1.4 Reference method

The validation study was carried out by EN ISO 11290-1/A1 :2004(#).
The plan of the method appears in appendix A.

1.5 Background of certification

Initial validation.
The RayAl Listeria method was validated with the certificate number RAY 32/03-07/10.

2 Comparative study of methods

2.1 Relative accuracy, relative specificity and relative sensitivity

The aim of the study, according to the reference document EN ISO 16140, is to compare the performances of the two methods:
- the reference method EN ISO 11290-1/A1 :2004,
- the RayAl Listeria method,

on samples naturally contaminated and not contaminated with *Listeria* spp.

2.1.1 Number and nature of the samples

According to the EN ISO 16140 standard, a minimum of 60 products per category must be analysed, with around 50% of positive products (at least 30 results) and 50% of negative products.

During the study, 316 samples were analysed.

Each category was divided into various types and the results are displayed as follows:

Category	Types	Positive results*	Negative results	Total
Meat products	Raw meat	11	14	25
	Raw seasoned meat	12	5	17
	Delicatessen, ready-made meal…	12	11	23
	Total	**35**	**30**	**65**
Dairy products	Cow raw milks and cheeses	11	9	20
	Goat and ewe milk cheeses	8	10	18
	Desserts, powders of milk	14	10	24
	Total	**33**	**29**	**62**
Vegetables	Frozen	6	11	17
	Raw vegetables or 4th range ones	10	5	15
	Seasoned	14	15	29
	Total	**30**	**31**	**61**
Fish products	Fish fillets and shellfish	12	7	19
	Smoked fish	11	20	31
	Ready-made meal with fish	8	9	17
	Total	**31**	**36**	**67**
Environment	Process waters	10	6	16
	Surface samples	10	14	24
	Residues and scraps	10	11	21
	Total	**30**	**31**	**61**
TOTAL		**159**	**157**	**316**

*these are positive results by either the one or the other method

2.1.2 Artificial contamination of the samples and percentage

Artificial contamination was achieved by using stressed bacterial suspensions, the stress treatment and efficiency of which have been determined according to EN ISO 16140 and AFNOR validation rules.
43 samples were positive after artificial contamination on a total of 159 positive results of *Listeria monocytogenes.*
In total, 27% of positive results were obtained as a result of artificial contamination.

2.1.3 Results of assays

The analyses were performed singly using the two methods.
The results of analysed samples are presented in appendix B.

The 316 results are presented in the table below:

	Positive reference method (R+)	**Negative reference method (R-)**
Positive alternative method (A+)	Positive agreement (A+/R+) ***PA = 152***	Positive deviation (R-/A+) ***PD = 3***
Negative alternative method (A-)	Negative deviation (A-/R+) ***ND = 4****	Negative agreement (A-/R-) ***NA = 157****

Legend : *A+ = positive confirmed*
*A- = immediate negatives **and** negatives after confirmation when presumed positive*
** All the ELISA RayAl Listeria positive results were confirmed positive*

The results by samples categories are presented below:

Meat products (65)	**Positive reference method (R+)**	**Negative reference method (R-)**
Positive alternative method (A+)	Positive agreement (A+/R+) ***PA = 34***	Positive deviation (R-/A+) ***PD = 1***
Negative alternative method (A-)	Negative deviation (A-/R+) ***ND = 0***	Negative agreement (A-/R-) ***NA = 30***

Dairy products (62)	**Positive reference method (R+)**	**Negative reference method (R-)**
Positive alternative method (A+)	Positive agreement (A+/R+) ***PA = 33***	Positive deviation (R-/A+) ***PD = 0***
Negative alternative method (A-)	Negative deviation (A-/R+) ***ND = 0***	Negative agreement (A-/R-) ***NA = 29***

Fish products (67)	**Positive reference method (R+)**	**Negative reference method (R-)**
Positive alternative method (A+)	Positive agreement (A+/R+) ***PA = 28***	Positive deviation (R-/A+) ***PD = 1***
Negative alternative method (A-)	Negative deviation (A-/R+) ***ND = 2***	Negative agreement (A-/R-) ***NA = 36***

Vegetables (61)	**Positive reference method (R+)**	**Negative reference method (R-)**
Positive alternative method (A+)	Positive agreement (A+/R+) ***PA = 27***	Positive deviation (R-/A+) ***PD = 1***
Negative alternative method (A-)	Negative deviation (A-/R+) ***ND = 2***	Negative agreement (A-/R-) ***NA = 31***

Environment (61)	**Positive reference method (R+)**	**Negative reference method (R-)**
Positive alternative method (A+)	Positive agreement (A+/R+) ***PA = 30***	Positive deviation (R-/A+) ***PD = 0***
Negative alternative method (A-)	Negative deviation (A-/R+) ***ND = 0***	Negative agreement (A-/R-) ***NA = 31***

2.1.4 Calculation of relative accuracy (AC), relative specificity (SP) and relative sensitivity (SE)

All previous results are used to calculate the relative accuracy, relative sensitivity and relative specificity of each category, according to the calculation of the EN ISO 16140 standard.

The results obtained with RayAl Listeria test + confirmations are summarised in the tables below:

Category	**PA**	**NA**	**ND**	**PD**	**Sum** N	**Relative accuracy AC (%)** [100x(PA+NA])/N	**N+** PA + ND	**Relative sensitivity SE (%)** [100xPA]/N+	**N-** NA + PD	**Relative specificity SP (%)** [100xNA]/N-
Meat products	**34**	**30**	**0**	**1**	65	98.5	34	100.0	31	96.8
Dairy products including raw milk cheeses	**33**	**29**	**0**	**0**	62	100.0	33	100.0	29	100.0
Fish products including smoked fish	**28**	**36**	**2**	**1**	67	95.5	30	93.3	37	97.3
Vegetables	**27**	**31**	**2**	**1**	61	95.1	29	93.1	32	96.9
Environment	**30**	**31**	**0**	**0**	61	100.0	30	100.0	31	100.0
TOTAL	**152**	**157**	**4**	**3**	**316**	**97.8**	**156**	**97.4**	**160**	**98.1**

The percentage values of the alternative method calculated for the following three criteria according to the EN ISO 16140 standard were:

Relative accuracy: ***AC***	97.8 %
Relative specificity : ***SP***	98.1 %
Relative sensitivity : ***SE***	97.4 %

The AFNOR Technical Bureau asks the sensitivity of both methods to be calculated with consideration of all the confirmed positives (this includes the additional positives of the alternative method):

	Alternative method (PA + PD) / (PA + PD + ND)	**Reference method** (PA + ND) / (PA + PD + ND)
All results	97.5 %	98.1 %

2.1.5 Analysis of discrepant results

According to annex F of the EN ISO 16140 standard, the minimum number of discordances for which a statistical test must be conducted in order to compare the two methods is 6.

If the number of discordances is between 6 and 22, the aim is the determination of the M value, depending on the total number of discordances and according to the EN ISO 16140 (appendix F) and the comparison between M and an m-value, as the smaller of the two values of PD and ND.
Both methods would be considered as equivalent if m > M.

In this study, among 316 analyzed samples and 159 positive results, 7 results were discordant between both methods (4 false negative results and 3 additional positive results), whatever is confirmation option (from Listeria selective agar according to Ottaviani and Agosti O&A or Rapid'*L.mono* agar RLM).

A statistic test (binomial law) was performed.

Number of discordances	**M**	**m**	**Conclusion**
7	0	3	Equivalence

Both methods are **not different in statistical terms**.

2.1.6 Comments on confirmations and RELM broth cold storage

Comments on confirmations

The positive samples at the conclusion of the RayAl Listeria test were confirmed after isolation from the not heated RELM enrichment - on two selective agars : *Listeria* selective agar according to Ottaviani & Agosti (Ottaviani Agosti Agar – AL BIO-RAD) and RAPID' *L.mono* agar (RLM BIO-RAD).
Concerning positive corresponding results, the strains of *Listeria monocytogenes* and *Listeria* not *monocytogenes* found according to both methods were similar (type of strains, mixture of strains).

Comments on RELM broths storage at 2-8°C for 72 h

The RELM broths were tested by RayAL *Listeria*, just after incubation and after preservation for 72 h at 2-8°C.
Globally, the results obtained after the cold storage, were the same to those obtained directly after incubation, with the exception of two samples (F19 and G26).

2.2. Relative detection level

The objective was to determine the level of contamination for which less than 50% of the responses obtained are positive and that for which more than 50% of the responses obtained are positives.

Different « food matrix strain » couples were studied in parallel with the reference method and the RayAl Listeria method, for the five representative studied categories.
The artificial contaminations were realized according to EN ISO 16140 and AFNOR validation rules.

The levels of detection, calculated according to the Spearman – Kärber* method (LOD_{50}), obtained for each combination "matrix-strain" are the following:

		Relative detection level(CFU/ 25 g or 25ml) with confidence interval[(1)] LOD_{50}	
Matrix	Strain	Reference method	Alternative method
Rillette	*L. welshimeri* 6b	0.4 [0.2 – 0.7]	0.4 [0.2 – 0.7]
Raw milk	*L. ivanovii*	0.5 [0.3 – 1.0]	0.5 [0.3 – 1.0]
Worn red cabbage	*L. monocytogenes* 4b	0.4 [0.2 – 0.9]	0.4 [0.2 – 0.9]
Smoked salmon	*L. monocytogenes* 1/2a	0.3 [0.2 – 0.4]	0.3 [0.2 – 0.4]
Process water	*L. innocua*	0.3 [0.2 – 0.5]	0.3 [0.2 – 0.5]

(1) LOD_{50}: estimation of level of contamination enabling positive detection by alternative method in 50 % of cases
**"Hitchins A. Proposed Use of a 50% Limit of Detection Value in Defining Uncertainty Limits in the Validation of Presence-Absence Microbial Detection Methods, Draft 10th December, 2003."*

The level of detection obtained for the RayAl Listeria method and the reference method is between 0.2 and 1.0 CFU/ 25 g.

2.3 Inclusivity / exclusivity

The inclusivity and the exclusivity of the alternative method are defined respectively by analysis of 50 positive strains and 30 negative strains.

2.3.1 Protocols

Protocol for inclusivity
A culture of each *Listeria* strains was prepared in a nutritive broth. Then, a Fraser 1/2 broth was inoculated with around 10 *Listeria* per 225ml and incubated for 20-24 hours at 30°C bef ore realization of complete protocol.

Protocol for exclusivity
The different negative strains were used to prepare pure cultures and diluted in nutritive broth to obtain levels of around 10^5 CFU per 225ml before realisation of RayAl Listeria ELISA.

In case of result being discordant with regard to that waited, a new assay must be realized with, in parallel, the reference method and the complete method RayAl Listeria method.

2.3.2 Results and conclusion

The results are presented in appendix C.
The 51 strains of *Listeria (*25 *L. monocytogenes,* 10 *L. innocua,* 6 *L. welshimeri,* 4 *L. ivanovii*, 3 *L. grayi* and 3 *L. seeligeri)* were detected out of 51 tested.

The study of 30 strains not belonging to the genus *Listeria* did not detect the presence of any cross-reaction (when the strains are grown in Fraser ½ and RELM).

3 Interlaboratory study

The aim of the interlaboratory study is to determine the variability of the results obtained in different laboratories using identical samples and to compare these results with those obtained in the methods comparison study.

3.1 Study organization

- Number of participating laboratories

14 laboratories received samples. The laboratories list is presented in appendix D.

- Matrix used

The “pasteurized milk” matrix was used to perform the inter-laboratory study.

- Strain used

The strain used for contaminations was a strain of *Listeria monocytogenes* 1/2b (reference L51, origin cheese).

- Number of samples per laboratory

24 samples were prepared per laboratory, distributed in 3 levels of contamination, with 8 samples per level.

3.2 Control of experimental parameters

3.2.1 Contamination levels obtained after artificial contamination

The following table shows the contamination rates obtained and estimated precisions:

Level	Samples	Targeted theoretical rate (CFU/25mL)	Real rate (CFU/25mL)	Estimated lower contamination limit per 25ml sample	Estimated upper contamination limit per 25ml sample
Level 0 (L0)	1-2-7-8-15-16-23-24	0	0	/	/
Low level (L1)	3-4-9-10-13-14-21-22	3	3.5	0.7	10.1
High level (L2)	5-6-11-12-17-18-19-20	30	29.0	19.4	41.8

3.2.2 Problems of temperature recorded during transport, temperature on reception and reception times

a) Analysis of temperature monitoring curves during transport

Temperatures registered by thermo button during shipment were stables and lower being in 8°C for the most laboratories (see table below).

b) Temperatures on reception and reception times

The temperatures obtained are recorded in the following table:

Laboratory	Temperatures at receipt (°C)		Comments
	Measured by the laboratory	Thermo button record	
A	/	/	Reception at D2. Samples analyses not realized
B	5.3	3.0	
C	4.0	2.0	
D	6.0	4.5	
E	8.0	2.5	
F	7.9	/	
G	5.4	6.2	
H	7.5	2.5	
I	13.2	13.0	Reception at D2. Samples analyses realized at D2
J	4.9	4,1	
K	/	5.1	Reception at D2. Samples analyses not realized
L	7.1	4.9	
M	Not communicated	/	
N	15.3	16.0	Reception at D2. Samples analyses realized at D2

Among the14 laboratories, 10 laboratories received samples the day after the sending.

The laboratory M did not communicate reception temperature and the thermo button was not received yet. Nevertheless, account held by the temperatures obtained to D1 for the other laboratories, we can consider that the temperature was in accordance for this laboratory.
As for the laboratory F, the temperature with reception is correct, but the thermo button was not still received. The temperatures indicated by the thermo button being generally subordinates or of the same order as those communicated by laboratories, conditions of reception can be validated for this laboratory.

Among 4 laboratories having received the parcel to J2,
- 2 laboratories (laboratory A and K) did not realize the analyses,
- 2 laboratories (laboratories I and N) analysed samples while the temperature was superior in 8℃ (respectively 13.2℃ and 15.3℃). Their results wer e not exploited.

3.2.3 Conclusion

Regarding the requirements of the validation about the condition of transport of samples, the results are exploitable for 10 laboratories (exclusion from laboratories A, K, I and N).

3.3 Results

3.3.1 Results obtained by cooperating laboratories

The detailed results are presented in appendix D and the following tables give a synthesis of the results obtained by all laboratories.

Positive results obtained with the reference method

Laboratory	Levels of contamination					
	L0		L1		L2	
	Positive results	Total samples	Positive results	Total samples	Positive results	Total samples
B	0	8	8	8	8	8
C	0	8	8	8	8	8
D	0	8	8	8	8	8
E	0	8	8	8	8	8
F	0	8	8	8	8	8
G	0	8	8	8	8	8
H	0	8	8	8	8	8
J	0	8	8	8	8	8
L	0	8	8	8	8	8
M	0	8	8	8	8	8
N*	0	8	8	8	8	8
Total	0	80	80	80	80	80
	(a)		(b)		(c)	

Positive results obtained with the alternative method

Laboratory	Levels of contamination					
	L0		L1		L2	
	Positive results	Total samples	Positive results	Total samples	Positive results	Total samples
B	0	8	8	8	8	8
C	0	8	8	8	8	8
D	0	8	8	8	8	8
E	0	8	8	8	8	8
F	0	8	8	8	8	8
G	0	8	8	8	8	8
H	0	8	8	8	8	8
J	0	8	8	8	8	8
L	0	8	8	8	8	8
M	0	8	8	8	8	8
N*	0	8	8	8	8	8
Total	0	80	80	80	80	80
	(a)		(b)		(c)	

**Temperature on reception was not acceptable (reception at D2 > 8℃).*

(a) : False positive

(b) : True positive at level 1

(c) : True positive at level 2

3.3.2 Conclusion with comments (discordances with expected results, exclusions… for instance)

The results of the reference method and the alternative method were in agreement between the reference method and the alternative method, and corresponding in the expected results for all the laboratories that performed the analyses.

3.4 Calculations

The results of 10 laboratories were considered.
Note: the positive results of the alternative method were all confirmed.

3.4.1 Calculation of specificity percentage (% SP) and sensitivity percentage (% SE) for both methods

The percentages of specificity (SP) and sensitivity (SE) were calculated according to the EN ISO 16140 calculations.

For level L0, it is requested that the specificity percentage (%SP) should be calculated using each of the methods:
SP = {1-(FP/N-)} x 100

where FP, number of false positives
N-, total number of tests L0

For levels L1 and L2, it is requested that the sensitivity percentage (%SE) should be calculated for each of the methods, compared with the number of expected positive results:
SE = (TP/N+) x 100

where TP, number of true positives
N+, total number of tests L1 or L2

The results are given in the following table:

Level	Reference method		Alternative method	
	SP/SE	**LCL* %**	**SP/SE**	**LCL* %**
L0	SP% = 100	98	SP% = 100	98
L1	SE% = 100	98	SE% = 100	98
L2	SE% = 100	98	SE% = 100	98
L1+L2	SE% = 100	98	SE% = 100	98

* LCL: low critical value, defined by EN ISO 16140 standard

3.4.2 Calculation of the relative precision (AC)

The relative precision is calculated using the following formula:
AC = {(PA + NA) / N} x 100

where PA, number of positive agreements
NA, number of negative agreements

The results for all the results are resumed below.

	Positive reference method (R+)	**Negative reference method (R-)**	**Total**
Positive alternative method (A+)	Positive agreement (A+/R+) PA = 160	Positive deviation (R-/A+) PD = 0	**(N+) = 160**
Negative alternative method (A-)	Negative deviation (A-/R+) ND = 0*	Negative agreement (A-/R-) NA =80*	**(N-) = 80**
Total	**(N+) = 160**	**(N-) = 80**	**N = 240**

* including no positive RayAl Listeria test not confirmed

The values of relative accuracy of the alternative method with regard to the reference method were calculated for each of the levels and are reported in the table below.

	AC %	LCL* %
Level L0	100	98
Level L1	100	98
Level L2	100	98
Level L1 + L2	100	98
Total	100	98

* LCL: low critical value, defined by EN ISO 16140 standard

3.4.3 Analysis of discordances

As defined in annex F of the EN ISO 16140 standard, the minimum number of discordances beyond which a statistical test must be carried out to compare the two methods is 6.
Therefore, this statistical test was not used because no discordance was observed between the two methods.
Both methods are considered as equivalent.

3.5 Interpretation

3.5.1 Comparison of relative precision (AC), specificity (SP) and sensitivity (SE) values

The values obtained in the two parts of the validation study are given in the following table:

	Inter laboratory study	**Comparative study**
Relative accuracy (AC)	100.0 %	97.8 %
Sensitivity (SE)	100.0 %	97.4 %
Specificity (SP)	100.0 %	98.1 %

The values obtained further to the inter-laboratory study are superior to those obtained during the preliminary study.

The AFNOR Technical Board requests the calculation of the sensitivity of the two methods with consideration of all confirmed positives (true positive results):

Alternative method	**Reference method**
(PA + PD) / (PA + PD + ND) = **100 %**	(PA + ND) / (PA + PD + ND) = **100 %**

3.5.2 Accordance (DA)

The accordance is the percentage chance of finding the same result from two identical test portions analyzed in the same laboratory under repeatability conditions: a single operator using the same instrument and the same reagents within the shortest feasible time interval.
The first step to calculate the accordance is to calculate the probability that two identical samples give the same result for each of the participating laboratories, and then to determine the average of the probabilities of all laboratories.

The different tables used to determine the accordance are given in appendix E and the accordance of each method at each level is given in the following table:

Level	**Reference method**		**Alternative method**	
L0	DA % =	100	DA % =	100
L1	DA % =	100	DA % =	100
L2	DA % =	100	DA % =	100

3.5.3 Concordance

The concordance is the percentage chance of finding the same result for two identical samples analyzed in two different laboratories.
The objective is to calculate the percentage of all pairs giving the same results on all possible pairs of results.

Result tables used to make these calculations are given in appendix F and the concordance of each method at each level is given in the following table:

Level	Reference method		Alternative method	
L0	Concordance % =	100	Concordance % =	100
L1	Concordance % =	100	Concordance % =	100
L2	Concordance % =	100	Concordance % =	100

3.5.4 Odds Ratio (COR)

The concordance odds ratio is calculated using the following formula:

$$COR = \frac{\text{accordance} \times (100 - \text{concordance})}{\text{concordance} \times (100 - \text{accordance})}$$

The concordance odds ratio of each method and at each level is given in the following table:

Level	Reference method		Alternative method	
L0	COR =	1.00	COR =	1.00
L1	COR =	1.00	COR =	1.00
L2	COR =	1.00	COR =	1.00

A value of 1.00 for the Odds ratio means that accordance and concordance are equal.
When the Odds ratio increases, the interlaboratory variation becomes more predominant.

4 Practicability

Practicability is studied as a function of the 13 criteria defined by the technical board in comparing the reference method EN ISO 11290-1 (2004) to the RayAl Listeria method.

1.Packaging mode of the components of the method (see package insert) *2. Reagent volumes* *(see package insert and vial packaging)*	The RayAl Listeria kit contains the quantity of reagent necessary for 5 × 93 samples analyses : - 5 microtitre plates with 12 strips for 8 wells individually packed - 1 vial of negative control (green label) : 1× 5ml, ready-to-use reagent - 1 vial of positive control (red label) : 1× 5ml, ready-to-use reagent - 1 vial of conjugate (orange label) : 1× 60ml, ready-to-use reagent - 1 vial of TMB substrate (blue label) : 1× 60ml, ready-to-use reagent - 1 vial of stop solution (yellow label) : 1× 60ml, ready-to-use reagent - 5 vials of 60ml of concentrated washing solution : 5× 60ml, 1 vial for 1440ml final washing solution
3. Storage conditions of the components (see package insert) – Expiry of products not opened (see package insert)	The storage temperature of the kit is between 2℃ a nd 8℃. The kit expiry date is shown on the box label and on the different vials.
4. Modalities of use after first use (see package insert)	The kit components should be stored at 2℃ - 8℃. If stored according to the recommended conditions, all ready-to-use components are stable until the expiration date indicated on the label. The reconstituted washing buffer should be stored at 2-8℃ for a maximum of 4 months.
5. Equipments or necessary specific premises (see package insert)	Normal configuration and common material of a laboratory of microbiology. Necessary equipment: - Mixer typifies to stomacher - An air incubator at 30℃+/-1℃ - A water bath at 85-100℃ - A micro plate reader, or a DSX or DS2 instrument
6. Reagents ready for use or to be reconstituted (see package insert)	All the reagents are ready-to-use, except washing buffer. The conditions of the washing buffer preparation are described in the package insert.
7. Duration of training of the operator not familiar with the method	For an operator trained in standard techniques of microbiology, training in the technique requires less than 1 day.

8. Real time handling – Flexibility of the technique relative to the number of samples to be analysed

Steps	**Average time for a sample (min)**		**Average time for 30 samples (min)**	
	EN ISO 11290-1 Standard	**RayAl Listeria method**	**EN ISO 11290-1 Standard**	**RayAl Listeria method**
Preparation, weighing, dilution in Fraser 1/2 and stomaching	7	7	90	90
Transfer ½ Fraser in Fraser 1 or RELM	3	1	45	25
RayAl Listeria test (RELM heat shock, washing, OD reading,)	/	30	/	50
RayAl Listeria test (RELM heat shock, and automated assay procedure)	/	2	/	25
Streaking of ½ Fraser and Fraser on 2 selective agars including readings	10	/	90	/
Average total time (per sample) Manual procedure	**20.0 min**	**40.0 min**	**7.5 min**	**5.5 min**
Average total time (per sample) Automated procedure		**10.0 min**		**4.7 min**

These times correspond to negative samples for which no confirmation is necessary.

In the case of positive samples, it is necessary to add the time necessary for the confirmations.
For the alternative method, it is necessary to add the time necessary for the isolation on selective agar, approximately 1 minute by sample. The average time for the biochemical confirmation of a suspect colony from a selective agar was estimated in approximately 5 minutes.

The interest of the alternative method is the possibility of sorting out quickly the negative samples of the suspect samples and of decreasing the number of confirmations, as well as in the saving of time technician when analysing series of samples.

9. Time to result

Step	**Time required (Day)** RayAl Listeria method	**Time required (Day)** EN ISO 11290-1 standard
Realisation of pre-enrichment	D0	D0
Inoculation of Enrichment broths (Fraser 1 or RELM)	D1	D2
Realisation of RayAL Listeria test	D2	/
Streaking on selective media	/	D1 & D3
Reading the plates	/	D3 to D5
Obtaining negative results (if test is negative**)**	**D2**	**D3 to D7**
Negative results : - if no typical colony - if negative test	 / D2	 D5 /
Obtaining negative results (after negative confirmation if necessary)	**D3 to D5**	**D5 to D11**
- if positive test and negative confirmation tests	D3 to D7	D5 to D11
Obtaining positive results (after positive confirmation)	**D5 to D10**	**D9 to D12**
Streaking of RELM on selective media Reading the plates	D2 D3 to D4	/ /
Confirmation tests : - by reference method tests (including purification) - by biochemical strip without purification (isolated colony)	 D10 D5	 D9 to D12 /

10. Type de qualification of the operator	Level identical to that for the reference method
11. Steps common to the reference method	Pre-enrichment in ½ Fraser Confirmations (reference method tests including purification).
12. Traceability of the analysis results	All the results are saved in a history file in the automaton or the micro plate reader. A result sheet with the OD values could be printed and stored by the laboratory.
13. Maintenance by the laboratory	No specific maintenance, other than classical procedure for the microtitre plate reader. Note: RayAl Ltd offers a customer technical support for the possible problems during the ELISA procedure. For DSX (or DS2), a biannual maintenance is performed by RayAl Ltd. Weekly and monthly maintenance must be performed by the laboratory (refer to the recommendations of RayAl for each instrument). In the case of using micro plate reader, that must be checked according to manufacturer's recommendations.

5 General conclusion

The validation study of the methods was conducted according to the reference document EN ISO 16 140 (2003).

The **comparative study** allows assessing:
- the relative accuracy, the relative sensitivity and the relative specificity,
- the relative detection level,
- the inclusivity and the exclusivity.
-

The performances of the RayAl Listeria method were equivalent with those in the reference method EN ISO 11290-1/A1: 2004 by the analysis of 316 samples distributed in five categories of products.
The relative accuracy obtained was 97.8%, the relative sensitivity 97.4% and the relative specificity 98.1%, according to the calculations required by the NF EN ISO 16140 standard.
Number of discrepant results was 7:3 positive additional results and 4 false negative results.
Because the positive samples by the alternative method are positive confirmed samples, the sensitivities were recalculated relative to all positive results according to the calculations recommended by the AFNOR and are of 97.5% for the alternative method and 98.1% for the reference method.
In final, both methods were considered as statistically equivalent.

The relative level of detection of the RayAl Listeria method and of the reference method was evaluated by artificial contaminations of five different products, representative of five categories tested.
It was between 0.2 and 1.0 CFU/ 25g for the alternative method and the reference method.

The study of the specificity of the alternative method was good since all the strains of *Listeria* were detected (inclusivity) and no cross reaction was observed in the strains not belonging to genus *Listeria* when complete protocol was performed (exclusivity).

The **interlaboratory study** results obtained for all of the 10 selected laboratories show that the alternative method and the reference method have comparable values of relative accuracy, specificity and sensitivity and superior to those obtained during the preliminary study.

The variability of the alternative method (accordance, concordance, Odds ratio) was comparable with the variability of the reference method.

The set of results led to **AFNOR VALIDATION certification** according to EN ISO 16140, of the RayAl *Listeria* method (certificate n° RAY 32/03 – 07/10), for the detection of *Listeria* spp. in all human food products and environmental samples, **for a 4 years period**.

Lille, December 16th 2010

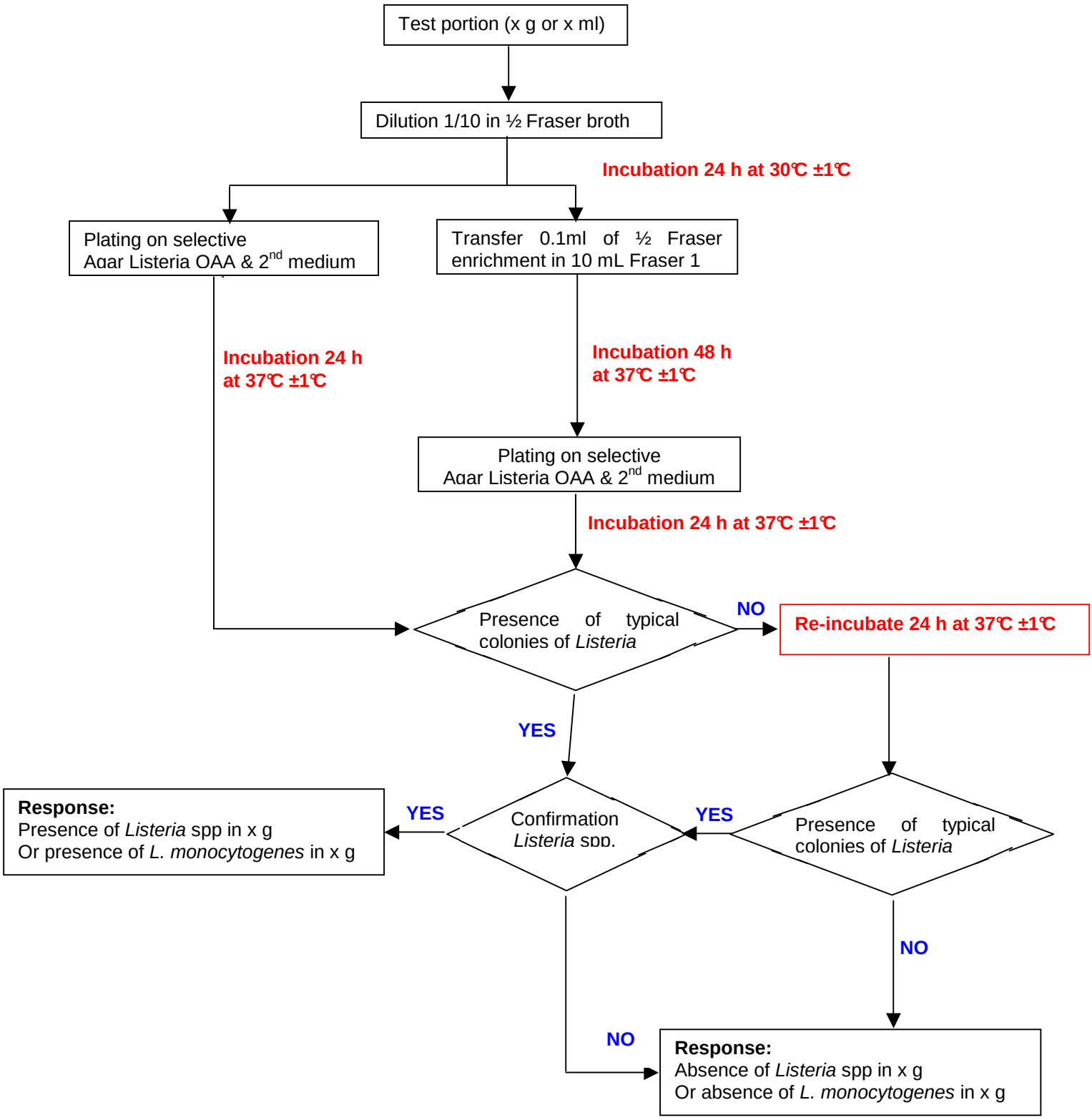
Virginie Ewe
Technical manager

APPENDICES

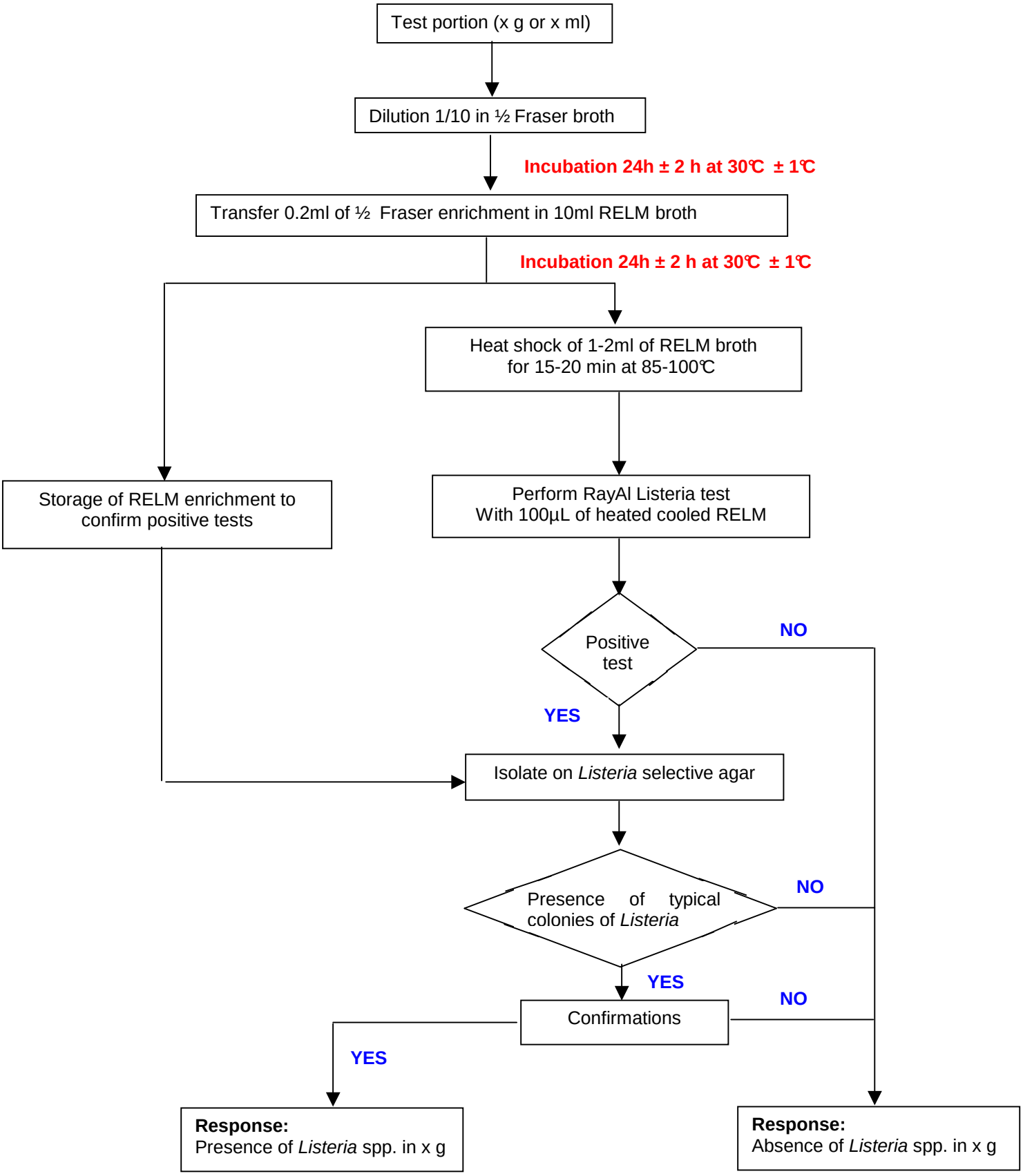
APPENDIX A:

ANALYTICAL PROTOCOLS

EN ISO STANDARD 11290-1/A1: 2004 (#)



RayAl Listeria alternative method



IPL Santé Environnement Durables Nord –1 rue du professeur Calmette – 59046 LILLE cedex - France

APPENDIX B:

RELATIVE ACCURACY, RELATIVE SPECIFICITE, RELATIVE SENSITIVITY
-
DETAILED RESULTS TABLES FOR EACH SAMPLE CATEGORY

LEGEND

Total bacteria growth
Ø : no growth
L = low
M = medium
H = high

Distribution of flora
suspicious colonies = colonies of Listeria monocytogenes and Listeria spp

A = pure culture of suspicious colonies
B = mix with a majority of suspicious colonies
C = mix with a minority of suspicious colonies
D = mix with rare suspicious colonies
E = absence of suspicious colonies
(x) : x typical colonies of *Listeria* if x ≤ 5

- (L…)(A…) on OAA : presence of blue colonie, with or without halo
- (L…)(A…) on RLM : presence of white or yellow colonie (Lspp)
* : mix of *Listeria*
O&A : Listeria agar according to Ottaviani & Agosti
RLM : Rapid'L.mono agar
IN BLUE Additional positives
IN RED False negatives

Categories of samples :
MP : Meat Products
DP : Dairy Products
FP : Fishery products
V : Vegetables
EN : Environment samples

Meat products

Code	Sample	Cat.	CA	Reference method EN ISO 11290-1 #						RayAl Listeria alternative method							RayAl Listeria alternative method - RELM 72h +4°C						
				Fraser 1/2		Fraser																	
				O&A	PALCAM	O&A	PALCAM	*Identification*	Final result	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison
C9	Deep-frozen burger	MP1	*No*	+LB	+LD(1)	+MB*	+MB	*Listeria monocytogenes Listeria welshimeri*	+	1.338	+	+MB	+MB	*Listeria monocytogenes Listeria welshimeri*	+	=	2.771	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=
C10	Deep-frozen minced beef	MP1	*No*	+LB	+LB	+MB	+HB	*Listeria monocytogenes Listeria innocua*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=
C11	Turkey cutlet	MP1	*No*	+LB	+LB	+MB*	+HB	*Listeria monocytogenes Listeria seeligeri*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes Listeria seeligeri*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes Listeria seeligeri*	+	=
C14	Minced beef 20 % MG	MP1	*No*	+LA	+LB	+MA	+HB	*Listeria monocytogenes*	+	9.944	+	+MA	+HA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
C30	angel hair pasta	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.025	-	/	/	/	-	=	/	/	/	/	/	-	=
C31	Minced beef 15 % MG	MP1	*No*	Ø	Ø	+MA	+MA	*Listeria innocua*	+	9.944	+	+MA	+MA	*Listeria innocua*	+	=	9.930	+	+LA	+LA	*Listeria innocua*	+	=
D8	Minced beef	MP1	*No*	+LA	+LA	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	9.937	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria innocua*	+	=
E8	Minced meat deep-frozen tradition	MP1	*No*	+LB	+LA	+MA	+HB	*Listeria welshimeri*	+	2.386	+	+MA	+MA	*Listeria welshimeri*	+	=	9.944	+	+MA	/	*Listeria welshimeri*	+	=
F2	Deep-frozen minced beef	MP1	*No*	+LC	+LB	+MB*	+HB	*Listeria monocytogenes Listeria welshimeri*	+	9.943	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria welshimeri*	+	=
F22	Minced meat vrac	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.020	-	/	/	/	-	=	/	/	/	/	/	-	=
G18	Deep-frozen minced meat vrac	MP1	*No*	+LB	+LA(3)	+MB	+MB	*Listeria monocytogenes*	+	9.938	+	+MB	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
G35	Bovine meat to fry	MP1	*No*	-LE	Ø	-LE	Ø	/	-	0.058	-	/	/	/	-	=	/	/	/	/	/	-	=
H21	Walnut Cottage to fry	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.069	-	/	/	/	-	=	/	/	/	/	/	-	=
H22	Turkey cutlet	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.127	-	/	/	/	-	=	/	/	/	/	/	-	=
H23	Pork chop	MP1	*No*	+LA	+LA	+MA	+HA	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
H24	Chicken breast	MP1	*No*	Ø	Ø	-LE	-LE	/	-	0.126	-	/	/	/	-	=	/	/	/	/	/	-	=
I18	Chicken way Thai	MP1	*No*	+LB	+LA	+MB	+MB	*Listeria welshimeri*	+	2.334	+	+LA	+MA	*Listeria welshimeri*	+	=	9.942	+	+LA	+LA	*Listeria welshimeri*	+	=
L2	Minced beef 5%MG	MP1	*No*	Ø	Ø	-LE	Ø	/	-	0.031	-	/	/	/	-	=	/	/	/	/	/	-	=
L3	Pork chops	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.032	-	/	/	/	-	=	/	/	/	/	/	-	=
L4	Veal cutlet	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.036	-	/	/	/	-	=	/	/	/	/	/	-	=
L9	Lamb	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.019	-	/	/	/	-	=	/	/	/	/	/	-	=
L10	Minced beef	MP1	*No*	-LE	Ø	-LE	Ø	/	-	0.050	-	/	/	/	-	=	/	/	/	/	/	-	=
L11	Turkey tenderloin	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.021	-	/	/	/	-	=	/	/	/	/	/	-	=
O1	Minced meat	MP1	*No*	Ø	Ø	Ø	Ø	/	-	0.058	-	/	/	/	-	=	/	/	/	/	/	-	=
O4	Minced meat of calf	MP1	*No*	-LE	-LE	-LE	Ø	/	-	0.034	-	/	/	/	-	=	/	/	/	/	/	-	=
B13	Knackwurst	MP2	*No*	Ø	Ø	Ø	Ø	/	-	0.035	-	/	/	/	-	=	/	/	/	/	/	/	/
C6	U.S. net	MP2	*No*	-LE	-LE	+MB*	+HB	*Listeria monocytogenes*	+	3.113	+	+LB	+MB	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
C29	Chipolatas	MP2	*No*	+LA	+MA	+MA	+MA	*Listeria welshimeri*	+	9.944	+	+MA	+MA	*Listeria welshimeri*	+	=	9.930	+	+MA	+MA	*Listeria welshimeri*	+	=
C38	Flesh with tomatoes prepared	MP2	*No*	+LB*	+MB*	+MB*	+HB	*Listeria monocytogenes Listeria innocua*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=
D10	Chipolatas	MP2	*No*	+LB	+LA	+MB	+HB	*Listeria monocytogenes Listeria innocua*	+	9.937	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria innocua*	+	=
D11	Merguez sausage	MP2	*No*	+LA	+LA	+MB	+HB	*Listeria innocua*	+	9.937	+	+MA	+MB*	*Listeria innocua*	+	=	9.944	+	+MA	/	*Listeria innocua*	+	=
E7	Smoked sausage	MP2	*No*	-LE	Ø	-LE	-ME	/	-	0.023	-	/	/	/	-	=	/	/	/	/	/	-	=
F1	Chipolatas	MP2	*No*	+LB*	+LB*	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	9.943	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria welshimeri*	+	=
F18	Sausage meat	MP2	*No*	+LB*	+LB*	+MB*	+HB	*Listeria monocytogenes Listeria innocua*	+	9.943	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria innocua*	+	=
G1	Frozen meatballs to stuffed tomatoes	MP2	*No*	+LC*	+LB*	+MB	+HB	*Listeria monocytogenes Listeria welshimeri*	+	9.938	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.951	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=
G2	Frozen meatballs to stuffed tomatoes	MP2	*No*	+MB*	+MB*	+MB*	+HB	*Listeria monocytogenes Listeria welshimeri*	+	3.277	+	+MB*	+LB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.951	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=
G32	Sausages	MP2	*No*	-LE	Ø	-LE	-LE	/	-	0.026	-	/	/	/	-	=	/	/	/	/	/	-	=
I1	Knackwurst	MP2	*No*	+LA(3)	+LA	+MA	+HB	*Listeria innocua*	+	3.398	+	+MA	+MA	*Listeria innocua*	+	=	9.942	+	+MA	+MA	*Listeria innocua*	+	=
L1	Chopped bolognaise	MP2	*No*	+LA	+LB	+MB	+HB	*Listeria welshimeri*	+	3.416	+	+LA	+LA	*Listeria welshimeri*	+	=	9.952	+	+LA	+MA	*Listeria welshimeri*	+	=
L8	Chipolatas	MP2	*No*	+LB	+LB	+MB	+HB	*Listeria monocytogenes*	+	9.935	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MA	+MA	*Listeria monocytogenes*	+	=

Meat products

Code	Sample	Cat.	*CA*	Reference method EN ISO 11290-1 #						RayAl Listeria alternative method							RayAl Listeria alternative method - RELM 72h +4°C						
				Fraser 1/2		Fraser		*Identification*	Final result	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison
				O&A	PALCAM	O&A	PALCAM																
B9	Pizza ham	MP3	*No*	+MB*	+MB	+MB*	+HB	*Listeria monocytogenes Listeria welshimeri*	+	9.940	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.944	+	+MB*	+MA	*Listeria monocytogenes Listeria welshimeri*	+	=
B10	Pizza ham	MP3	*No*	+MB	+MB	+MB	+HB	*Listeria welshimeri*	+	9.940	+	+MA	+MA	*Listeria welshimeri*	+	=	9.944	+	+MA	+MA	*Listeria welshimeri*	+	=
B11	Salami	MP3	*No*	-LE	Ø	-LE	-LE	/	-	0.043	-	/	/	/	-	=	/	/	/	/	/	/	/
B12	White sausage	MP3	*No*	Ø	Ø	+MA	+MB	*Listeria innocua*	+	9.940	+	+MA	+MA	*Listeria innocua*	+	=	9.944	+	+MA	+MA	*Listeria innocua*	+	=
C4	White sausage	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.068	-	/	/	/	-	=	/	/	/	/	/	-	=
C5	Salty breast	MP3	*No*	+LB*	+LB*	+MB*	+HB	*Listeria monocytogenes Listeria innocua*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=
C7	Pork belly	MP3	*No*	+LA(1)	+LB	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+MB	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
C8	Stuffed white sausage	MP3	*No*	+LA(2)	+LA(1)	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
C12	Pizza to the chicken	MP3	*No*	+MB*	+LA	+MB*	+HB	*Listeria monocytogenes Listeria welshimeri*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=
C13	Royal pizza	MP3	*No*	+MB*	+MB	+MB	+HB	*Listeria welshimeri*	+	9.944	+	+MB*	+MA	*Listeria welshimeri*	+	=	9.930	+	+MA	+MA	*Listeria welshimeri*	+	=
C25	Dry ham	MP3	*No*	-LE	-LE	Ø	-LE	/	-	0.032	-	/	/	/	-	=	/	/	/	/	/	-	=
C35	Roast pork with sauce	MP3	*No*	+LB	+LB	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.930	+	+MB	+MB	*Listeria monocytogenes*	+	=
C36	Veal olive	MP3	*No*	+LB*	+LB*	+MB	+HB	*Listeria monocytogenes Listeria welshimeri*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=
C37	Pie crust	MP3	*No*	+LA	+LB	+MA	+HB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
F19	Boiled ham	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.204	+	+LA(1)	+LA(1)	*Listeria innocua*	+	PS	0.091	-	Ø	/	/	/	=
F20	Clear-cut sausage	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.067	-	/	/	/	-	=	/	/	/	/	/	-	=
F21	Forest pâté	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.035	-	/	/	/	-	=	/	/	/	/	/	-	=
G21	Bacon	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.038	-	/	/	/	-	=	/	/	/	/	/	-	=
G22	Mortadelle	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.040	-	/	/	/	-	=	/	/	/	/	/	-	=
G33	Obernay saveloy	MP3	*No*	-LE	-LE	Ø	Ø	/	-	0.023	-	/	/	/	-	=	/	/	/	/	/	-	=
L5	Blanquette of veal	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.052	-	/	/	/	-	=	/	/	/	/	/	-	=
L6	Beef bourguignon	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.013	-	/	/	/	-	=	/	/	/	/	/	-	=
L7	Roast pork butcher	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.015	-	/	/	/	-	=	/	/	/	/	/	-	=
O2	Minced meat pie in the meat	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.044	-	/	/	/	-	=	/	/	/	/	/	-	=
O3	Roast pork butcher	MP3	*No*	Ø	Ø	Ø	Ø	/	-	0.047	-	/	/	/	-	=	/	/	/	/	/	-	=

Dairy products

Code	Sample	Cat.	*CA*	Reference method EN ISO 11290-1 #						RayAl Listeria alternative method							RayAl Listeria alternative method - RELM 72h +4°C						
				Fraser 1/2		Fraser																	
				O&A	PALCAM	O&A	PALCAM	*Identification*	Final result	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison
A7	Brie de Meaux cheese	DP1	*Yes*	-LE	-LE	Ø	Ø	/	-	0.053	-	/	/	/	-	=	/	/	/	/	/	/	/
A8	Munster farmer unpasteurized milk	DP1	*Yes*	-LE	Ø	Ø	Ø	/	-	0.053	-	/	/	/	-	=	/	/	/	/	/	/	/
C22	Norman cheese in the raw milk	DP1	*No*	Ø	Ø	Ø	Ø	/	-	0.029	-	/	/	/	-	=	/	/	/	/	/	-	=
D5	Raw milk Camembert cheese	DP1	*No*	Ø	Ø	+MB	+HB	*Listeria monocytogenes*	+	9.937	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F24	Munster in the raw milk	DP1	*Yes*	-LE	Ø	Ø	Ø	/	-	0.033	-	/	/	/	-	=	0.134	-	Ø	/	/	-	=
F25	Reblochon farmer	DP1	*Yes*	Ø	Ø	Ø	Ø	a	-	0.022	-	/	/	/	-	=	/	/	/	/	/	-	=
F26	Neufchatel in the raw milk	DP1	*Yes*	Ø	Ø	Ø	Ø	/	-	0.027	-	/	/	/	-	=	/	/	/	/	/	-	=
G8	Roquefort	DP1	*No*	+LA(3)	Ø	+MB	Ø	*Listeria ivanovii*	+	0.236	+	+MA	+MA	*Listeria ivanovii*	+	=	0.348	+	+MA	+MA	*Listeria ivanovii*	+	=
G9	Raw milk cheese	DP1	*No*	+LB	+LA	+MB	+HB	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
G10	Cheese pizza	DP1	*No*	+MB*	+MB*	+MB*	+MB	*Listeria monocytogenes* *Listeria innocua*	+	9.938	+	+MA	+MA	*Listeria innocua*	+	=	9.951	+	+MB*	+MA	*Listeria monocytogenes* *Listeria innocua*	+	=
G11	St Félicien in the raw milk	DP1	*No*	-LE	Ø	+MA	+MA	*Listeria monocytogenes*	+	0.723	+	+MA	+MA	*Listeria monocytogenes*	+	=	0.832	+	+MA	+MA	*Listeria monocytogenes*	+	=
G12	Roquefort	DP1	*No*	+LA(1)	+LA(3)			*Listeria ivanovii*	+	0.361	+	+MA	+MA	*Listeria ivanovii*	+	=	0.377	+	+MA	+MA	*Listeria ivanovii*	+	=
G13	Mont d'or cheese	DP1	*No*	-LE	Ø	Ø	Ø	/	-	0.057	-	/	/	/	-	=	/	/	/	/	/	-	=
G14	Cheese pizza	DP1	*No*	+MB*	+MB	+MB*		*Listeria monocytogenes* *Listeria welshimeri*	+	9.938	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria welshimeri*	+	=	9.951	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria welshimeri*	+	=
H13	Little Saint Nectaire cheese	DP1	*Yes*	+LB	+LB	+MB	+MB	*Listeria monocytogenes*	+	9.942	+	+MB	+MB	*Listeria monocytogenes*	+	=	3.430	+	+MB	+MB	*Listeria monocytogenes*	+	=
J5	Tomme cheesein the raw milk	DP1	*Yes*	-LE	Ø	-LE	Ø	/	-	0.032	-	/	/	/	-	=	/	/	/	/	/	-	=
J6	Raw milk Morbier cheese	DP1	*Yes*	Ø	Ø	Ø	Ø	/	-	0.021	-	/	/	/	-	=	/	/	/	/	/	-	=
J13	Raclette cheese from raw milk	DP1	*No*	+LA	Ø	+MA	+HA	*Listeria welshimeri*	+	9.942	+	+MA	+MA	*Listeria welshimeri*	+	=	9.942	+	+MA	+MA	*Listeria welshimeri*	+	=
K22	Carré du vinage raw milk cheese	DP1	*No*	-LE	Ø	+MA	+MA	*Listeria monocytogenes*	+	0.573	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MA	+MA	*Listeria monocytogenes*	+	=
L15	Reblochon farmer	DP1	*Yes*	+LB	+LA(2)	+MA	+HB	*Listeria innocua*	+	9.935	+	+MA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
A5	Goat cheese with ash in the raw milk	DP2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.095	-	/	/	/	-	=	/	/	/	/	/	/	/
A6	Mini Chevrot raw milk	DP2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.021	-	/	/	/	-	=	/	/	/	/	/	/	/
A9	Raw milk goat cheese	DP2	*Yes*	-LE	-LE	-ME	-ME	/	-	0.026	-	/	/	/	-	=	/	/	/	/	/	/	/
A10	" Le Chevrot " Raw milk goat cheese	DP2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.021	-	/	/	=	-	=	/	/	/	/	/	/	/
B2	Raw milk cheese	DP2	*No*	-LE	-LE	Ø	-LE	/	-	0.026	-	/	/		-	=	/	/	/	/	/	/	/
D6	Ewe cheese farmer	DP2	*No*	Ø	+LA(1)	+MB	+HB	*Listeria monocytogenes*	+	9.937	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F27	Goat cheese	DP2	*Yes*	-LE	-LE	+MB	+HB	*Listeria monocytogenes*	+	3.438	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
G19	Ossau iraty raw milk	DP2	*No*	-LE	Ø	-ME	-ME	/	-	0.034	-	/	/	/	-	=	/	/	/	/	/	-	=
G20	Ewe cheese farmer	DP2	*No*	-LE	Ø	-LE	Ø	/	-	0.029	-	/	/	/	-	=	/	/	/	/	/	-	=
H14	Feta cheese with nettles	DP2	*Yes*	+LB	+LB(4°	+MB	+HB	*Listeria monocytogenes*	+	9.942	+	+MB	+MA	*Listeria monocytogenes*	+	=	3.346	+	+MB	+MB	*Listeria monocytogenes*	+	=
H15	Ossau iraty raw milk	DP2	*Yes*	+LA	+LB	+MB	+MB	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	3.361	+	+MA	+MA	*Listeria monocytogenes*	+	=
H16	Ossau iraty raw milk	DP2	*Yes*	-LE	-LE	+MB	+HB	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
J7	Sainte Maure of Touraine	DP2	*Yes*	-LE	Ø	Ø	Ø	/	-	0.025	-	/	/	/	-	=	/	/	/	/	/	-	=
J8	Goat cheese of Selles sur Cher	DP2	*Yes*	-ME	Ø	-LE	-LE	/	-	0.026	-	/	/	/	-	=	/	/	/	/	/	-	=
K21	Ossau iraty raw milk	DP2	*No*	-LE	Ø	Ø	Ø	/	-	0.018	-	/	/	/	-	=	/	/	/	/	/	-	=
L12	Goat cheese with ash	DP2	*Yes*	+LA	+LA	+MA	+MA	*Listeria innocua*	+	9.935	+	+MA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
L13	Buchette goat	DP2	*Yes*	+LA(3)	+LA(3)	+MA	+HA	*Listeria innocua*	+	9.935	+	+MA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
L14	Goat cheese	DP2	*Yes*	+MA	+LA	+MA	+MB	*Listeria innocua*	+	9.935	+	+MA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
B1	Strawberry duet	DP3	*No*	+MB	+MB	+MB	+HB	*Listeria monocytogenes*	+	9.940	+	+MA	+MB*	*Listeria monocytogenes*	+	=	9.944	+	+MA	+MB	*Listeria monocytogenes*	+	=
B3	Glass cups fruity in citrus fruits	DP3	*No*	+LB	+LB	+MA	+HB		+	2.552	+	+LB*	+LB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.944	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=
C19	Tropézienne pie	DP3	*No*	+MB	+MB	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+HA	*Listeria monocytogenes*	+	=
C20	Cheese pizza	DP3	*No*	+LB	+LB	+MB*	+HB	*Listeria monocytogenes* *Listeria welshimeri*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria welshimeri*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria welshimeri*	+	=
C21	cheese pizza	DP3	*No*	+LB	+LB	+MA	+HB	*Listeria welshimeri*	+	9.944	+	+MA	+MA	*Listeria welshimeri*	+	=	9.930	+	+MA	+MA	*Listeria welshimeri*	+	=
C39	Whipped cream puffs	DP3	*No*	+MA	+MA	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+HA	*Listeria monocytogenes*	+	=
D1	Profiterolles	DP3	*No*	+MA	+HA	+MB	+MB	*Listeria monocytogenes*	+	9.937	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	
D2	Tarts Profiteroles	DP3	*No*	+MB	+MB	+MB	+MB	*Listeria monocytogenes*	+	9.937	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
D3	Individual chocolate Versaillais cake	DP3	*No*	+LC	+LB	+MB	+HB	*Listeria monocytogenes*	+	9.937	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.944	+	+MB	/	*Listeria monocytogenes*	+	=
D4	Chocolate Versaillais cake	DP3	*No*	-ME	-LE	+MB	+HB	*Listeria monocytogenes*	+	9.937	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
D7	Raw milk	DP3	*No*	Ø	Ø	Ø	Ø	/	-	0.018	-	/	/	/	-	=	/	/	/	/	/	-	=
E1	Chocolate cake	DP3	*No*	-ME	-LE	-ME	-ME	/	-	0.029	-	/	/	/	-	=	/	/	/	/	/	-	=
E2	Whipped cream puffs	DP3	*No*	Ø	Ø	Ø	Ø	/	-	0.020	-	/	/	/	-	=	/	/	/	/	/	-	=
E3	Versaillais cake	DP3	*No*	-LE	-LE	-ME	-ME	/	-	0.035	-	/	/	/	-	=	/	/	/	/	/	-	=
E4	Whipped cream puffs	DP3	*No*	+MA	+MB	+MB	+HB	*Listeria monocytogenes*	+	9.923	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
E10	Cheese pizza	DP3	*No*	+MB	+MB	+MB	+HB	*Listeria welshimeri*	+	9.923	+	+MB	+MA	*Listeria welshimeri*	+	=	3.271	+	+MA	/	*Listeria welshimeri*	+	=
G27	Milk powder	DP3	*No*	-LE	-LE	-ME	-LE	/	-	0.041	-	/	/	/	-	=	/	/	/	/	/	-	=
G28	Chocolate-eclair	DP3	*No*	-LE	Ø	Ø	Ø	/	-	0.044	-	/	/	/	-	=	/	/	/	/	/	-	=
G29	Tarts in fruits	DP3	*No*	-LE	Ø	-ME	-ME	/	-	0.067	-	/	/	/	-	=	/	/	/	/	/	-	=
G30	Duet fruits dessert	DP3	*No*	Ø	Ø	-ME	-ME	/	-	0.046	-	/	/	/	-	=	/	/	/	/	/	-	=
G31	Versaillais cake	DP3	*No*	-LE	-LE	-LE	-LE	/	-	0.035	-	/	/	/	-	=	/	/	/	/	/	-	=
I30	Raw milk	DP3	*No*	Ø	Ø	Ø	Ø	/	-	0.112	-	/	/	/	-	=	/	/	/	/	/	-	=
K23	Raw milk	DP3	*No*	+LA(1)	Ø	+MA	+HB	*Listeria monocytogenes*	+	3.305	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MA	+MA	*Listeria monocytogenes*	+	=
L20	Raw milk	DP3	*No*	+MB*	+MB	+MB*	+HB	*Listeria monocytogenes* *Listeria innocua*	+	9.935	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.952	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=

Fishery products

Code	Sample	Cat.	CA	Reference method EN ISO 11290-1 #						RapAl Listeria alternative method							RapAl Listeria alternative method - RELM 72h +4°C						
				Fraser 1/2		Fraser																	
				O&A	PALCAM	O&A	PALCAM	*Identification*	Final result	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison
A1	Scampis	FP1	*Yes*	Ø	Ø	Ø	Ø	/	-	0.033	-	/	/	/	-	=	/	/	/	/	/	/	/
A2	Brown shrimps	FP1	*Yes*	-LE	Ø	-LE	Ø	/	-	0.061	-	/	/	/	-	=	/	/	/	/	/	/	/
A12	Net of Pangasus	FP1	*Yes*	+MB*	+MB*	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	9.938	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.944	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=
B8	Shrimps	FP1	*No*	+MB	+MB	+MB	+MB	*Listeria monocytogenes*	+	9.940	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=
C1	Crab	FP1	*No*	Ø	Ø	Ø	Ø	/	-	0.044	-	/	/	/	-	=	/	/	/	/	/	/	/
C2	Shrimps	FP1	*No*	Ø	Ø	+MA	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+LA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
C24	Nets of pangasus	FP1	*No*	+MB	+HB	+MB	+MB	*Listeria monocytogenes Listeria innocua*	+	3.416	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=
D16	Whiting filet	FP1	*No*	Ø	Ø	-LE	Ø	/	-	0.042	-	/	/	/	-	=	/	/	/	/	/	-	=
D17	Net of Pangasus	FP1	*No*	+MA	+HA	+MB	+HB	*Listeria monocytogenes*	+	9.937	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
D19	Net of Pangasus	FP1	*No*	+MB*	+MB*	+MB	+HB	*Listeria monocytogenes Listeria innocua*	+	9.937	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria innocua*	+	=
D20	Coley filet	FP1	*No*	+MB*	+MB*	+MB*	+HB	*Listeria monocytogenes Listeria innocua*	+	9.937	+	+LB	+LB*	*Listeria monocytogenes Listeria innocua*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria innocua*	+	=
D22	Shrimps calibre 10 / 15	FP1	*No*	+LA	+LA	+MB	+HB	*Listeria monocytogenes*	+	3.224	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F6	Gambas	FP1	*No*	+LA(2)	Ø	+MA	+MA	*Listeria monocytogenes*	+	9.943	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F7	Crab claws	FP1	*No*	+MB	+MA	+MB	+HB	*Listeria monocytogenes*	+	9.943	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
G3	Whole shrimps	FP1	*No*	-LE	Ø	-LE	Ø	/	-	0.028	-	/	/	/	-	=	/	/	/	/	/	-	=
G4	Net of Pangasus	FP1	*No*	+MA	+MB	+MB	+MB	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
H17	Shrimps	FP1	*No*	+MB	+MA	+MB	+MB	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
H18	Brown shrimps	FP1	*No*	-ME	Ø	-ME	-ME	/	-	0.065	-	/	/	/	-	=	/	/	/	/	/	-	=
H19	Big shrimps	FP1	*No*	-LE	Ø	Ø	Ø	/	-	0.066	-	/	/	/	-	=	/	/	/	/	/	-	=
A13	Smoked trout	FP2	*No*	Ø	-LE	Ø	-LE	/	-	0.057	-	/	/	/	/	/	/	/	/	/	/	/	/
C40	Atlantic smoked salmon chips	FP2	*No*	Ø	Ø	+MB	+HB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
D18	Smoked haddock	FP2	*No*	+MB*	+MB*	+MB*	+HB	*Listeria monocytogenes Listeria innocua*	+	9.937	+	+MB*	+MB*	*Listeria monocytogenes Listeria innocua*	+	=	9.944	+	+MB*	/	*Listeria monocytogenes Listeria innocua*	+	=
D25	Burger of salmon	FP2	*No*	+LA(3)	+LA(1)	+MB*	+HB	*Listeria monocytogenes Listeria welshimeri*	+	3.147	+	+MB	+MB*	*Listeria monocytogenes Listeria welshimeri*	+	=	9.944	+	+MB	/	*Listeria monocytogenes Listeria welshimeri*	+	=
E5	Nets of smoked mackerels	FP2	*No*	-LE	-LE	-LE	-LE	/	-	9.923	+	+LC	+LC	*Listeria seeligeri*	+	PS	9.944	+	+MC	/	*Listeria seeligeri*	+	=
E6	Smoked haddock	FP2	*No*	+MB	+MB	+MB	+MB	*Listeria monocytogenes*	+	9.923	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+LA	/	*Listeria monocytogenes*	+	=
E12	Atlantic smoked salmon	FP2	*No*	Ø	Ø	Ø	Ø	/	-	0.029	-	/	/	/	-	=	/	/	/	/	/	-	=
E13	Scottish smoked salmon	FP2	*No*	Ø	Ø	Ø	Ø	/	-	0.014	-	/	/	/	-	=	/	/	/	/	/	-	=
E14	Smoked trout	FP2	*No*	-ME	-ME	Ø	-ME	/	-	0.021	-	/	/	/	-	=	/	/	/	/	/	-	=
E15	Smoked eels	FP2	*No*	Ø	Ø	Ø	Ø	/	-	0.014	-	/	/	/	-	=	/	/	/	/	/	-	=
E16	Norwegian smoked salmon	FP2	*No*	-LE	Ø	Ø	Ø	/	-	0.037	-	/	/	/	-	=	/	/	/	/	/	-	=
F11	Norwegian smoked salmon	FP2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.045	-	/	/	/	-	=	/	/	/	/	/	-	=
F12	Smoked trout	FP2	*Yes*	Ø	Ø	Ø	-LE	/	-	0.044	-	/	/	/	-	=	/	/	/	/	/	-	=
F17	Smoked salmon	FP2	*No*	+LA(1)	+LA(4)	+LA	+MB	*Listeria monocytogenes*	+	9.943	+	+LB	+LB	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F23	Mackerel filet in the pepper	FP2	*No*	Ø	Ø	Ø	-LE	/	-	0.034	-	/	/	/	-	=	/	/	/	/	/	-	=
G23	Atlantic smoked salmon	FP2	*No*	Ø	Ø	Ø	Ø	/	-	0.033	-	/	/	/	-	=	/	/	/	/	/	-	=
G24	Marinaded herrings	FP2	*No*	Ø	Ø	Ø	Ø	/	-	0.026	-	/	/	/	-	=	/	/	/	/	/	-	=
G25	Sliced salmon smoked in the dill	FP2	*No*	Ø	Ø	-LE	Ø	/	-	0.070	-	/	/	/	-	=	/	/	/	/	/	-	=
G26	Scottish smoked salmon in 3 seaweeds	FP2	*No*	-LE	Ø	+MA	+MA	*Listeria welshimeri*	+	0.122	-	/	/	/	-	*FN*	0.433	+	+LA	+LA	*Listeria welshimeri*	+	=
I2	Norwegian smoked salmon	FP2	*No*	Ø	Ø	Ø	Ø	/	-	0.046	-	/	/	/	-	=	/	/	/	/	/	-	=
I8	Atlantic smoked salmon	FP2	*No*	Ø	Ø	-LE	Ø	/	-	0.036	-	/	/	/	-	=	/	/	/	/	/	-	=
I16	Smoked salmon	FP2	*No*	Ø	Ø	Ø	Ø	/	-	0.025	-	/	/	/	-	=	/	/	/	/	/	-	=
I24	Net of mackerels	FP2	*No*	-LE	Ø	Ø	Ø	/	-	0.058	-	/	/	/	-	=	/	/	/	/	/	-	=
K4	Alaska smoked salmon	FP2	*No*	-LE	Ø	Ø	Ø	/	-	0.066	-	/	/	/	-	=	/	/	/	/	/	-	=
K8	Smoked eels	FP2	*No*	+MA	+HA	+MB	+MB	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MA	+MA	*Listeria monocytogenes*	+	=
K18	Atlantic smoked salmon chips	FP2	*No*	-ME	Ø	-ME	-LE	/	-	0.024	-	/	/	/	-	=	/	/	/	/	/	-	=
K19	Tartar of wild smoked salmon	FP2	*No*	-LE	Ø	+LA	+LA	*Listeria innocua*	+	0.243	+	+LA	+LA	*Listeria innocua*	+	=	9.952	+	+LA	+MA	*Listeria innocua*	+	=
N7	Salmon tartar	FP2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.039	-	/	/	/	-	=	/	/	/	/	/	-	=
N8	Smoked salmon	FP2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.037	-	/	/	/	-	=	/	/	/	/	/	-	=
O5	Marinaded herrings	FP2	*No*	+MA	+MA	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9,962	+	+MA	+MA	*Listeria monocytogenes*	+	=
O6	Smoked salmon chips	FP2	*No*	+LA	+LA	+LA	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9,951	+	+MA	+MA	*Listeria monocytogenes*	+	=

Fishery products

Code	Sample	Cat.	CA	Reference method EN ISO 11290-1 #						RayAl Listeria alternative method							RayAl Listeria alternative method - RELM 72h +4°C						
				Fraser 1/2		Fraser																	
				O&A	PALCAM	O&A	PALCAM	*Identification*	Final result	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison
B7	Fish + rice + zucchinis + sauce	FP3	*No*	+LC	-LE	+MA	+MB	*Listeria monocytogenes*	+	0.217	+	+LA	+LA	*Listeria monocytogenes*	+	=	0.399	+	+LA	+LA	*Listeria monocytogenes*	+	=
C3	Cooked whelks	FP3	*No*	-LE	Ø	+LB	+MB	*Listeria monocytogenes*	+	1.088	+	+MA	+LA	*Listeria monocytogenes*	+	=	9.930	+	+LB	+LA	*Listeria monocytogenes*	+	=
C23	Cooked whelks	FP3	*No*	-LE	Ø	-LE	Ø	/	-	0.057	-	/	/	/	-	=	/	/	/	/	/	-	=
C32	Cooked whelks	FP3	*No*	-LE	Ø	-LE	Ø	/	-	0.043	-	/	/	/	-	=	/	/	/	/	/	-	=
C34	Fish filet in sauce	FP3	*No*	Ø	Ø	-LE	Ø	/	-	0.034	-	/	/	/	-	=	/	/	/	/	/	-	=
D21	Cooked whelks	FP3	*No*	-LE	Ø	-LE	-LE	/	-	0.049	-	/	/	/	-	=	/	/	/	/	/	-	=
F9	Cubes of fish wipe chive	FP3	*Yes*	Ø	Ø	Ø	Ø	/	-	0.026	-	/	/	/	-	=	/	/	/	/	/	-	=
F10	Coley filet in the short broth	FP3	*Yes*	+LA	+LA	+MA	+MB	*Listeria innocua*	+	9.943	+	+MA	+MA	*Listeria innocua*	+	=	9.944	+	+MA	/	*Listeria innocua*	+	=
G5	Doughnuts of fish	FP3	*No*	+LA(1)	Ø	+MA	+HA	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
G34	Fish in herbs	FP3	*No*	-LE	Ø	Ø	Ø	/	-	0.037	-	/	/	/	-	=	/	/	/	/	/	-	=
H20	Cooked whelks	FP3	*No*	-LE	Ø	-LE	-LE	/	-	0.067	-	/	/	/	-	=	/	/	/	/	/	-	=
I7	Mini brochettes Kadaif	FP3	*No*	-LE	-LE	-ME	-ME	/	-	0.039	-	/	/	/	-	=	/	/	/	/	/	-	=
K1	Paella in seafoods	FP3	*No*	Ø	Ø	-LE	Ø	/	-	0.027	-	/	/	/	-	=	/	/	/	/	/	-	=
K9	Net of halibut and vegetables	FP3	*No*	+MB	+HB	+MB	+HB	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MB	+MA	*Listeria monocytogenes*	+	=
K13	Fish Bordelaise	FP3	*No*	+LB	+LD	+MB	+HB	*Listeria monocytogenes*	+	0.079	-	-ME	-ME	/	-	FN	0.125	-	-ME	-ME	/	-	FN
N1	Pasta salad to the salmon	FP3	*No*	+LA	+LA	+MA	+MA	*Listeria innocua*	+	9.936	+	+MA	+MA	*Listeria innocua*	+	=	9.944	+	+MA	+MA	*Listeria innocua*	+	=
N5	Salmon in the sorrel and the pastas	FP3	*No*	+LA(2)	+LA(3)	+MA	+MA	*Listeria innocua*	+	9.936	+	+MA	+MA	*Listeria innocua*	+	=	9.944	+	+MA	+MA	*Listeria innocua*	+	=

Vegetables

Code	Sample	Cat.	CA	Reference method EN ISO 11290-1 #						RAYAL Listeria alternative method							RAYAL Listeria alternative method - RELM 72h +4°C						
				Fraser 1/2		Fraser																	
				O&A	PALCAM	O&A	PALCAM	*Identification*	Final result	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison
C15	Deep-frozen chips	V1	*No*	+MB	+HB	+MA	+MB	*Listeria monocytogenes*	+	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.930	+	+MB	+MB	*Listeria monocytogenes*	+	=
C26	Deep-frozen chips	V1	*No*	+HB	+HB	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.930	+	+MB	+MB	*Listeria monocytogenes*	+	=
G6	Deep-frozen chips	V1	*No*	Ø	Ø	-LE	Ø	/	-	9.938	+	+MA	+MA	*Listeria seeligeri*	-		9.951	+	+LA	+LA	*Listeria seeligeri*	+	PS
G7	Potatoes	V1	*No*	Ø	Ø	Ø	Ø	/	-	0.074	-	/	/	/	-	=	/	/	/	/	/	-	=
H25	Deep-frozen spinach	V1	*No*	Ø	Ø	Ø	Ø	/	-	0.050	-	/	/	/	-	=	/	/	/	/	/	-	=
I20	Deep-frozen matchstick potatoes	V1	*No*	Ø	Ø	Ø	Ø	/	-	0.031	-	/	/	/	-	=	/	/	/	/	/	-	=
I21	Deep-frozen potatoes	V1	*No*	Ø	Ø	Ø	Ø	/	-	0.032	-	/	/	/	-	=	/	/	/	/	/	-	=
I22	Spinach connect frozen food	V1	*No*	-LE	Ø	Ø	Ø	/	-	0.021	-	/	/	/	-	=	/	/	/	/	/	-	=
I25	Frozen chips tradition	V1	*No*	Ø	Ø	Ø	Ø	/	-	0.046	-	/	/	/	-	=	/	/	/	/	/	-	=
K2	Deep-frozen chips	V1	*No*	+MB	+MB	+MB	+MB	*Listeria monocytogenes*	+	9.938	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.952	+	+LB	+MB	*Listeria monocytogenes*	+	=
K15	Deep-frozen potato matches	V1	*No*	+MA	+MA	+MA	+HB	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MA	+MA	*Listeria monocytogenes*	+	=
K16	Deep-frozen carrots	V1	*No*	-LE	Ø	Ø	Ø	/	-	0.066	-	/	/	/	-	=	/	/	/	/	/	-	=
K17	Deep-frozen zucchinis	V1	*No*	-LE	Ø	Ø	Ø	/	-	0.069	-	/	/	/	-	=	/	/	/	/	/	-	=
K24	Deep-frozen aromatic herbs	V1	*No*	-LE	Ø	Ø	Ø	/	-	0.019	-	/	/	/	-	=	/	/	/	/	/	-	=
K25	Deep-frozen peas	V1	*No*	-LE	-LE	-LE	-LE	/	-	0.027	-	/	/	/	-	=	/	/	/	/	/	-	=
K26	Deep-frozen chopped spinach	V1	*No*	+MA	+LB	+MB	+MB	*Listeria monocytogenes* *Listeria innocua*	+	3.381	+	+MB	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.952	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=
K27	Deep-frozen sliced thinly onions	V1	*No*	Ø	Ø	Ø	Ø	/	-	0.078	-	/	/	/	-	=	/	/	/	/	/	-	=
C16	Broccolis 4th range	V2	*No*	Ø	+LA(2)	+MB*	+MB	*Listeria monocytogenes* *Listeria innocua*	+	9.944	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.930	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=
C17	Pieces of citrus fruits	V2	*No*	Ø	Ø	Ø	Ø	/	-	0.017	-	/	/	/	-	=	/	/	/	/	/	-	=
H1	Salad of lamb's lettuces	V2	*Yes*	-LE	-LE	+MB	+MB	*Listeria monocytogenes*	+	0.800	+	+LD	+LB	*Listeria monocytogenes*	+		1.941	+	+MC	+MB	*Listeria monocytogenes*	+	=
H2	Salad mixs gourmand	V2	*Yes*	+LB	Ø	+MB	+MB	*Listeria monocytogenes*	+	2.415	+	+LB	+LB	*Listeria monocytogenes*	+	=	9.951	+	+MB	+MB	*Listeria monocytogenes*	+	=
H6	Grated carrot	V2	*Yes*	Ø	Ø	+MB	+MB	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
H7	Lettuce heart	V2	*Yes*	+LA	+LA	+MA	+MB	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
H8	Red oak leaf lettuce	V2	*Yes*	+LB	+LB	+MB	+MB	*Listeria innocua*	+	9.942	+	+MA	+MA	*Listeria innocua*	+	=	3.368	+	+MA	+MA	*Listeria innocua*	+	=
H9	Salad of lamb's lettuces	V2	*Yes*	+LB	+LB	+MB	+MB	*Listeria innocua*	+	9.942	+	+MB	+MA	*Listeria innocua*	+	=	3.394	+	+MA	+MA	*Listeria innocua*	+	=
I10	Salad of mangetout pea, tomatoes	V2	*No*	-LE	-LE	+LA(3)	+LA(1)	*Listeria monocytogenes*	+	0.049	-	Ø	Ø	/	-	FN	0.074	-	Ø	Ø	/	-	FN
J2	Batavia	V2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.101	-	/	/	/	-	=	/	/	/	/	/	-	=
J3	Green cabbage	V2	*Yes*	Ø	Ø	Ø	Ø	/	-	0.049	-	/	/	/	-	=	/	/	/	/	/	-	=
J4	Mixed salad leaves	V2	*Yes*	+LA	Ø	+MB	+MB	*Listeria seeligeri*	+	9.942	+	+LB	+LA	*Listeria seeligeri*	+	=	9.942	+	+MA	+MA	*Listeria seeligeri*	+	=
K3	Heart of curled	V2	*No*	+LB	+LB	+MB	+HB	*Listeria monocytogenes* *Listeria seeligeri*	+	9.938	+	+MB	+MB*	*Listeria monocytogenes* *Listeria seeligeri*	+	=	9.952	+	+LB	+LB*	*Listeria monocytogenes* *Listeria seeligeri*	+	=
N2	Deep-frozen chips	V2	*No*	Ø	Ø	Ø	Ø	/	-	0.055	-	/	/	/	-	=	/	/	/	/	/	-	=
B5	Rice + corn + peppers	V3	*No*	-LE	-LE	-LE	-LE	/	-	0.057	-	/	/	/	-	=	/	/	/	/	/	/	/
B6	Red cabbage vinaigrette	V3	*No*	Ø	Ø	Ø	Ø	/	-	0.031	-	/	/	/	-	=	/	/	/	/	/	/	/
C18	Guacamole	V3	*No*	Ø	Ø	Ø	Ø	/	-	0.019	-	/	/	/	-	=	/	/	/	/	/	-	=
C33	Beets	V3	*No*	+LA	+LA	+MA	+MA	*Listeria innocua*	+	9.944	+	+MA	+MA	*Listeria innocua*	+	=	9.930	+	+MA	+MA	*Listeria innocua*	+	=
D13	Salad, tomatoes, cucumbers, olives	V3	*No*	Ø	Ø	-LE	Ø	/	-	0.073	-	/	/	/	-	=	/	/	/	/	/	-	=
D14	Salad cucumbers and chive	V3	*No*	Ø	Ø	Ø	Ø	/	-	0.017	-	/	/	/	-	=	/	/	/	/	/	-	=
D15	Mushrooms vinaigrette	V3	*No*	-LE	Ø	-LE	Ø	/	-	0.031	-	/	/	/	-	=	/	/	/	/	/	-	=
E9	Beets	V3	*No*	-LE	Ø	-ME	-ME	/	-	0.060	-	/	/	/	-	=	/	/	/	/	/	-	=
E17	Mixed turnips wipe yoghurt	V3	*No*	+MA	+MA	+MB	+HB	*Listeria innocua*	+	9.923	+	+MA	+MA	*Listeria innocua*	+	=	3.300	+	+MA	/	*Listeria innocua*	+	=
F5	Salad of flageolets and tomatoes	V3	*No*	Ø	Ø	Ø	Ø	/	-	0.066	-	/	/	/	-	=	/	/	/	/	/	-	=
H3	Salad cabbage flower vinaigrette	V3	*Yes*	+LA	Ø	+MB	+MB	*Listeria monocytogenes*	+	1.169	+	+LA	+LB	*Listeria monocytogenes*	+	=	2.340	+	+MB	+MB	*Listeria monocytogenes*	+	=
H4	Leek vinaigrette	V3	*Yes*	+LA	+LA	+MB	+HB	*Listeria monocytogenes*	+	9.942	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.951	+	+MB	+MB	*Listeria monocytogenes*	+	=
H5	Cucumbers with the cream	V3	*Yes*	+LA	+LA	+MB	+MB	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.951	+	+MA	+MA	*Listeria monocytogenes*	+	=
H10	Grated carrot vinaigrette	V3	*Yes*	+LA	+LA	+MA	+MB	*Listeria innocua*	+	9.942	+	+MA	+MA	*Listeria innocua*	+	=	3.432	+	+MA	+MA	*Listeria innocua*	+	=
H11	Steamed zucchini	V3	*Yes*	+LA	-LE	+MA	+MB	*Listeria monocytogenes*	+	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=	3.405	+	+MA	+MA	*Listeria monocytogenes*	+	=
H12	Broccolis	V3	*Yes*	+MA	+LA	+MA	+MB	*Listeria innocua*	+	9.942	+	+MA	+MA	*Listeria innocua*	+	=	3.376	+	+MA	+MA	*Listeria innocua*	+	=
I4	Salad, grapefruit, tomatoes	V3	*No*	Ø	Ø	+LA(2)	+LA(2)	*Listeria monocytogenes*	+	0.078	-	Ø	Ø	/	-	FN	0.115	-	Ø	Ø	/	-	FN
I5	Pipérade	V3	*No*	+LA	+MA	+MA	+HB	*Listeria monocytogenes*	+	9.929	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=
I6	Tomatoes Mozarella	V3	*No*	+MA	+LA	+MB	+MB	*Listeria monocytogenes*	+	9.929	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=
I9	Pasta salad vinaigrette	V3	*No*	-LE	Ø	-ME	-ME	/	-	0.035	-	/	/	/	-	=	/	/	/	/	/	-	=
I12	Pastas in the vegetables of the sun	V3	*No*	+LD	+LC	+MB	+LC	*Listeria seeligeri*	+	9.929	+	+LA	+LA	*Listeria seeligeri*	+	=	9.942	+	+MA	+MA	*Listeria seeligeri*	+	=
I15	Tagliatelle with vegetables	V3	*No*	Ø	Ø	Ø	Ø	/	-	0.069	-	/	/	/	-	=	/	/	/	/	/	-	=
I17	Compound salad	V3	*No*	Ø	Ø	Ø	Ø	/	-	0.027	-	/	/	/	-	=	/	/	/	/	/	-	=
I19	Muddle vegetables and rice in 3 colors	V3	*No*	+LB	+LB	+MA	+MB	*Listeria innocua*	+	9.929	+	+LB	+LB	*Listeria innocua*	+	=	9.942	+	+MA	+MA	*Listeria innocua*	+	=
I26	Salad potatoes and olives	V3	*No*	Ø	Ø	-ME	-ME	/	-	0.060	-	/	/	/	-	=	/	/	/	/	/	-	=
J1	Purée of broccolis	V3	*Yes*	Ø	Ø	Ø	Ø	/	-	0.065	-	/	/	/	-	=	/	/	/	/	/	-	=
K7	Tomato salad	V3	*No*	-LE	Ø	-LE	-LE	/	-	0.049	-	/	/	/	-	=	/	/	/	/	/	-	=
K31	Tomato salad	V3	*No*	Ø	Ø	Ø	Ø	/	-	0.037	-	/	/	/	-	=	/	/	/	/	/	-	=
N4	Salad of lenses and chickpeas	V3	*No*	+LA	+LB	+MB*	+MB	*Listeria monocytogenes* *Listeria innocua*	+	9.936	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.944	+	+MB	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=

Environment

Code	Sample	Cat.	CA	Reference method EN ISO 11290-1 #						RayAl Listeria alternative method							RayAl Listeria alternative method - RELM 72h +4°C						
				Fraser 1/2		Fraser																	
				O&A	PALCAM	O&A	PALCAM	*Identification*	Final result	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison	OD_{450}	Test result	O&A	RLM	*Identification*	Final result	Comparison
D26	Stagnant water ground workshop	EN1	*No*	-LE	Ø	-ME	-ME	/	-	0.041	-	/	/	/	-	=	/	/	/	/	/	-	=
F15	Ice-cold water of 09/02/10	EN1	*Yes*	+LA	+LA(3)	+MB	+MB	*Listeria monocytogenes*	+	9.943	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F16	Drinking water of 08/02/10	EN1	*Yes*	+LA	LA	+MA	+MB	*Listeria monocytogenes*	+	9.943	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
H26	Water of rinsing	EN1	*No*	Ø	Ø	Ø	Ø	/	-	0.050	-	/	/	/	-	=	/	/	/	/	/	-	=
J9	Water of process of 23/02/10	EN1	*Yes*	Ø	Ø	Ø	Ø	/	-	0.024	-	/	/	/	-	=	/	/	/	/	/	-	=
J10	Water of network of 23/02/2010	EN1	*Yes*	Ø	Ø	Ø	Ø	/	-	0.029	-	/	/	/	-	=	/	/	/	/	/	-	=
K11	Water wash lines Spinach 1	EN1	*No*	Ø	Ø	Ø	Ø	/	-	0.068	-	/	/	/	-	=	/	/	/	/	/	-	=
K28	Water rinsing vegetables	EN1	*No*	Ø	Ø	Ø	Ø	/	-	0.015	-	/	/	/	-	=	/	/	/	/	/	-	=
K29	Water dirty tub	EN1	*No*	+LB	+LA	+MB	+HB	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MB	+MA	*Listeria monocytogenes*	+	=
L19	Surface 'shelf positive cold room'	EN1	*Yes*	+MA	+MA	+MA	+MA	*Listeria innocua*	+	9.935	+	+MA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
M2	Water process	EN1	*Yes*	Ø	Ø	+MA	+MA	*Listeria ivanovii*	+	2.362	+	+MA	+MB	*Listeria ivanovii*	+	=	9.956	+	+MA	+MA	*Listeria ivanovii*	+	=
M3	Water of refusal	EN1	*Yes*	Ø	Ø	+LA	+MA	*Listeria ivanovii*	+	2.512	+	+LA	+MA	*Listeria ivanovii*	+	=	9.956	+	+LA	+MA	*Listeria ivanovii*	+	=
M5	Water process	EN1	*Yes*	+LA	+LA	+MB	+MB	*Listeria monocytogenes*	+	3.391	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.956	+	+MA	+MA	*Listeria monocytogenes*	+	=
M8	Drinking water	EN1	*Yes*	+LA	+LA	+MB	+HB	*Listeria monocytogenes*	+	9.937	+	+MA	+MB	*Listeria monocytogenes*	+	=	9.956	+	+MA	+MA	*Listeria monocytogenes*	+	=
N9	Ice-cold water of 16/03/10	EN1	*Yes*	+LA	+LA	+MB	+MB	*Listeria monocytogenes*	+	9.936	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=
N10	Drinking water of 16/03/10	EN1	*Yes*	+LA	+LA(4)	+MA	+MB	*Listeria monocytogenes*	+	3.234	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=
C28	Surface table stainless steel stand butcher	EN2	*No*	Ø	Ø	Ø	-ME	/	-	0.067	-	/	/	/	-	=	/	/	/	/	/	-	=
D23	Surface stand caterer	EN2	*No*	+LA(1)	Ø	+MB	+MB	*Listeria monocytogenes*	+	1.239	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
D24	Surface slicer blade	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.020	-	/	/	/	-	=	/	/	/	/	/	-	=
D27	Surface slicer blade	EN2	*No*	Ø	Ø	Ø	-ME	/	-	0.011	-	/	/	/	-	=	/	/	/	/	/	-	=
D28	Surface clean knife	EN2	*No*	-LE	Ø	-ME	-LE	/	-	0.014	-	/	/	/	-	=	/	/	/	/	/	-	=
E18	Surface blade of spatula	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.001	-	/	/	/	-	=	/	/	/	/	/	-	=
E19	Surface knife for rillette cut	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.001	-	/	/	/	-	=	/	/	/	/	/	-	=
E20	Surface knife cuts net	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.001	-	/	/	/	-	=	/	/	/	/	/	-	=
F13	Surface ground workshop	EN2	*Yes*	+LA	+LA	+MB	+HB	*Listeria monocytogenes*	+	9.943	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F14	Surface stainless steel table	EN2	*Yes*	+LA	+LB	+MB	+MB	*Listeria monocytogenes*	+	9.943	+	+MB	+MB	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
F28	Surface slicer before wash	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.145	-	/	/	/	-	=	/	/	/	/	/	-	=
F29	Surface preparation before wash table	EN2	*No*	+LB	+LB*	+MB*	+MB*	*Listeria innocua* *Listeria welshimeri*	+	3.069	+	+LB	+LB	*Listeria innocua* *Listeria welshimeri*	+	=	9.944	+	+MB*	/	*Listeria innocua* *Listeria welshimeri*	+	=
G15	Surface threader white fishes	EN2	*No*	+LB*	+LB*	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	9.938	+	+MB*	+LB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.951	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=
G16	Surface chopper (horse meat)	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.037	-	/	/	/	-	=	/	/	/	/	/	-	=
G17	Surface trancheur (sausage)	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.066	-	/	/	/	-	=	/	/	/	/	/	-	=
J11	Surface ground workshop	EN2	*Yes*	-LE	-LE	-ME	-ME	/	-	0.051	-	/	/	/	-	=	/	/	/	/	/	-	=
J12	Surface wheel stainless devil cart	EN2	*Yes*	-LE	Ø	Ø	Ø	/	-	0.045	-	/	/	/	-	=	/	/	/	/	/	-	=
K12	Surface salts tray fishmonger's shop	EN2	*No*	Ø	Ø	Ø	Ø	/	-	0.033	-	/	/	/	-	=	/	/	/	/	/	-	=
K20	Surface stand fishmonger's shop	EN2	*No*	-ME	Ø	Ø	Ø	/	-	0.023	-	/	/	/	-	=	/	/	/	/	/	-	=
L17	New water	EN2	*Yes*	+MA	+LA	+MA	+MB	*Listeria innocua*	+	9.935	+	+MA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
L18	Network water	EN2	*Yes*	+MA	+MA	+MA	+HB	*Listeria innocua*	+	9.935	+	+MA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
M1	Surface lid trash can	EN2	*Yes*	-LE	-LE	+LB	+MB	*Listeria ivanovii*	+	2.755	+	+MB	+MB	*Listeria ivanovii*	+	=	2.678	+	+LA	+MA	*Listeria ivanovii*	+	=
M7	Surface tray rocks	EN2	*Yes*	+LA	+LA	+MB	+MB	*Listeria monocytogenes*	+	9.937	+	+MB	+MA	*Listeria monocytogenes*	+	=	9.956	+	+MA	+MA	*Listeria monocytogenes*	+	=
N11	Surface dirty knife	EN2	*Yes*	+MA	+LA	+MA	+MB	*Listeria monocytogenes*	+	3.275	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	+MA	*Listeria monocytogenes*	+	=
C27	Residues stand butcher's shop	EN3	*No*	Ø	Ø	+MB	+MB	*Listeria monocytogenes*	+	9.944	+	+LA	+MA	*Listeria monocytogenes*	+	=	9.930	+	+MA	+MA	*Listeria monocytogenes*	+	=
D9	Residues stand caterer	EN3	*No*	+LA(2)	+LA(2)	+MB	+HB	*Listeria monocytogenes*	+	9.937	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.944	+	+MA	/	*Listeria monocytogenes*	+	=
D12	Residues stand delicatessen	EN3	*No*	Ø	-LE	-LE	-ME	/	-	0.038	-	/	/	/	-	=	/	/	/	/	/	-	=
E11	Residues threader fishmonger's shop	EN3	*No*	-LE	Ø	-LE	-ME	/	-	0.057	-	/	/	/	-	=	/	/	/	/	/	-	=
F3	Residues meat cut	EN3	*No*	-LE	-LE	-ME	-LE	/	-	0.116	-	/	/	/	-	=	/	/	/	/	/	-	=
F4	Residues chopper	EN3	*No*	-LE	Ø	Ø	Ø	/	-	0.036	-	/	/	/	-	=	/	/	/	/	/	-	=
F8	Residues stand delicatessen	EN3	*No*	Ø	Ø	Ø	Ø	/	-	0.041	-	/	/	/	-	=	/	/	/	/	/	-	=
I23	Residues workshop fishmonger's shop	EN3	*No*	+MB	+MA	+MA	+MA	*Listeria monocytogenes*	+	3.203	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.942	+	+MA	+MA	*Listeria monocytogenes*	+	=
I27	Residues stand caterer	EN3	*No*	-LE	Ø	Ø	Ø	/	-	0.078	-	/	/	/	-	=	/	/	/	/	/	-	=
I28	Residues chain manufacturing peas	EN3	*No*	Ø	Ø	Ø	Ø	/	-	0.084	-	/	/	/	-	=	/	/	/	/	/	-	=
I29	Residues chain manufacturing epinards	EN3	*No*	-LE	Ø	-LE	Ø	/	-	0.057	-	/	/	/	-	=	/	/	/	/	/	-	=
K5	Residues workshop delicatessen	EN3	*No*	+LA	+LA	+MA	+HB	*Listeria monocytogenes*	+	9.938	+	+MA	+MA	*Listeria monocytogenes*	+	=	9.952	+	+MA	+MA	*Listeria monocytogenes*	+	=
K6	Residues salts red tub	EN3	*No*	+LA	+LB	+MB*	+HB	*Listeria monocytogenes* *Listeria innocua*	+	9.938	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.952	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=
K10	Residues ground workshop	EN3	*No*	-LE	Ø	-LE	-LE	/	-	0.042	-	/	/	/	-	=	/	/	/	/	/	-	=
K14	Residues rawdough (stand pastry)	EN3	*No*	-LE	-LE	-ME	Ø	/	-	0.019	-	/	/	/	-	=	/	/	/	/	/	-	=
K30	Residues chopper	EN3	*No*	+LC	+LB	+MB	+HB	*Listeria innocua*	+	3.408	+	+LA	+MA	*Listeria innocua*	+	=	2.780	+	+LB	+MA	*Listeria innocua*	+	=
L16	Residues line manufacturing zucchinis	EN3	*Yes*	+MA	+LA	+MA	+MB	*Listeria innocua*	+	9.935	+	+LA	+MA	*Listeria innocua*	+	=	9.952	+	+MA	+MA	*Listeria innocua*	+	=
M4	Residues vegetables line manufacturing	EN3	*Yes*	+LA	+LA	+LA	+MB	*Listeria ivanovii*	+	3.406	+	+MA	+MA	*Listeria ivanovii*	+	=	9.956	+	+MA	+MB	*Listeria ivanovii*	+	=
M6	Residues spinach line manufacturing	EN3	*Yes*	+LA	+LA	+LB	+MB	*Listeria monocytogenes*	+	9.937	+	+MA	+LA	*Listeria monocytogenes*	+	=	9.956	+	+LA	+MA	*Listeria monocytogenes*	+	=
N3	Residues chopper meat department	EN3	*No*	Ø	Ø	Ø	Ø	/	-	0.030	-	/	/	/	-	=	/	/	/	/	/	-	=
N6	Residues stand delicatessen	EN3	*No*	+MB	+LB	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	9.936	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=	9.944	+	+MB*	+MB*	*Listeria monocytogenes* *Listeria innocua*	+	=

APPENDIX C :

INCLUSIVITY / EXCLUSIVITY

LEGEND

Total bacteria growth
Ø : no growth
L = low
M = medium
H = high

Distribution of flora
suspicious colonies = colonies of *Listeria monocytogenes* and *Listeria* spp

A = pure culture of suspicious colonies
OAA or AL : *Listeria* selective agar according to Ottaviani & Agosti
RLM : Rapid'*L.mono* agar
- (L…)(A…) on OAA : presence of blue colonie, with or without halo
- (L…)(A…) on RLM : presence of blue colonies (with or without halo), or white or yellow colonies

Inclusivity

Reference	Strain	Origin	Inoculation rate in 225 mL Half-Fraser broth	OD_{450}	Test DSX result	Plating on	
						RLM	OAA
L1	*Listeria innocua*	ATCC33090	17.48	9.920	+	+MA	+MA
L2	*Listeria innocua*	Minced meat	18.52	9.920	+	+MA	+HA
L3	*Listeria innocua*	Cow's liver	9.88	9.920	+	+LA	+LA
L5	*Listeria monocytogenes* 1/2a	Lardons of smoked salmon	6.42	9.920	+	+MA	+MA
L12	*Listeria monocytogenes* 1/2a	Smoked salmon	20.8	9.920	+	+MA	+MA
L14	*Listeria monocytogenes* 1/2c	Minced meat	20.64	9.920	+	+MA	+MA
L17	*Listeria monocytogenes* 1/2c	Porc belly	15.1	9.920	+	+MA	+MA
L18	*Listeria monocytogenes* 1/2c	Munster	14.24	9.920	+	+MA	+MA
L37	*Listeria monocytogenes* 1/2b	Maroille in the raw milk	21.84	9.920	+	+MA	+MA
L43	*Listeria monocytogenes* 1/2a	Minced meat	26.5	9.924	+	+LA	+LA
L44	*Listeria monocytogenes* 1/2a	Sausage	21.2	9.920	+	+MA	+MA
L47	*Listeria monocytogenes* 1/2a	Fried potatoes	23.52	9.920	+	+MA	+MA
L51	*Listeria monocytogenes* 1/2b	Ripened cheese	19.92	9.920	+	+MA	+MA
L57	*Listeria monocytogenes* 4a	ATCC19114	18.8	9.920	+	+MA	+MA
L58	*Listeria monocytogenes 4b*	Salad	20.64	9.920	+	+MA	+MA
L61	*Listeria monocytogenes 4e*	ATCC19118	16.48	9.920	+	+MA	+HA
L62	*Listeria monocytogenes 4e*	Reblochon	29.36	9.920	+	+MA	+MA
L64	*Listeria innocua*	Époisses cheese	31.75	9.942	+	+MA	+MA
L66	*Listeria innocua*	Spinach	37.75	9.942	+	+MA	+MA
L72	*Listeria innocua*	Avesnes ball of cheese	30.5	9.942	+	+MA	+MA
L77	*Listeria innocua* 6a	Coarse pork sausage	33.25	9.942	+	+MA	+MA
L78	*Listeria innocua*	Young cockerel	30.5	9.942	+	+MA	+MA
L80	*Listeria ivanovii*	Collection	16.75	9.942	+	+MA	+MA
L81	*Listeria grayi*	ATCC19120	5.8	1.341	+	+LA	+LA
L83	*Listeria seeligeri* 1/2b	Pork tongue in frost	27.5	3.430	+	+MA	+MA
L84	*Listeria seeligeri*	Minced meat	23.5	9.942	+	+MA	+MA
L86	*Listeria welshimeri* 6b	ATCC35897	27.75	3.414	+	+MA	+MA
L87	*Listeria welshimeri*	Minced meat	29	3.426	+	+MA	+MA
L89	*Listeria welshimeri* 6a	Minced meat	21.25	3.431	+	+MA	+MA
L91	*Listeria welshimeri*	Rosette	30.25	9.942	+	+MA	+MA
L100	*Listeria welshimeri*	Soft margarine	34.25	9.942	+	+MA	+MA
L101	*Listeria welshimeri*	Ham in the former	35.25	9.942	+	+MA	+MA
L108	*Listeria innocua*	Gorgonzola cheese	23.25	9.924	+	+MA	+MA
L113	*Listeria innocua*	Smoked halibut	30.75	9.924	+	+MA	+MA
L115	*Listeria seeligeri*	Dirty water	19.5	9.924	+	+MA	+LA
L116	*Listeria monocytogenes* 1/2a	Shell of fish	26.25	9.924	+	+MA	+MA
L117	*Listeria monocytogenes* 1/2c	Sausage of Montbéliard	34.5	9.924	+	+MA	+MA
L119	*Listeria monocytogenes* 1/2a	Spinach	37	9.924	+	+MA	+LA
L123	*Listeria monocytogenes 4b*	Mozzarella	37.25	9.924	+	+MA	+MA
L124	*Listeria monocytogenes* 1/2	Fillet of perch	28.75	9.924	+	+MA	+MA
L125	*Listeria monocytogenes*	Fried vegetables	39.5	9.924	+	+MA	+MA
L129	*Listeria monocytogenes* 1/2a	Fried potatoes	8.75	9.924	+	+MA	+MA
L133	*Listeria ivanovii*	Roquefort	19.75	2.698	+	+MA	+MA
L143	*Listeria grayi*	Deep-frozen chips	84	3.218	+	+MA	+MA
L147	*Listeria grayi*	CIP 103213	190	3.058	+	+MA	+MA
L151	*Listeria ivanovii*	Piece of minced beef	33.25	2.605	+	+MA	+MA
L152	*Listeria monocytogenes* 1/2a	Environment sample	32.5	9.924	+	+MA	+MA
L153	*Listeria ivanovii*	Environment sample	20.75	3.256	+	+MA	+MA
L217	*Listeria monocytogenes 4b*	Environment sample	24.75	9.924	+	+LA	+MA
L223	*Listeria monocytogenes* 1/2c	Environment sample	30.5	9.924	+	+MA	+MA
L226	*Listeria monocytogenes* 3a	Terrine of net of herrings	23	9.924	+	+MA	+MA

Exclusivity

Reference	Strain	Origin	Inoculation rate in 225 mL BPW	OD_{450}	Test DSX result
BA2	*Bacillus cereus*	Beets	4.60E+04	0.128	-
BA14	*Bacillus cereus*	Egg	9.40E+04	0.164	-
BA19	*Bacillus cereus*	Environment	1.40E+05	0.131	-
BA4	*Bacillus stearothermophilus*	/	1.30E+05	0.041	-
BA7	*Bacillus coagulans*	/	3.50E+04	0.185	-
BA15	*Bacillus cereus*	Custard	4.50E+04	0.130	-
E1	*Enterococcus faecalis*	Egg	2.30E+05	0.080	-
E2	*Enterococcus faecium*	ATCC3286	3.90E+05	0.086	-
E6	*Enterococcus faecalis*	ATCC19433	9.90E+04	0.078	-
E7	*Enterococcus faecium*	CIP5433	1.30E+05	0.045	-
EN18	*Enterobacter cloacae*	Collection	1.30E+05	0.036	-
EN49	*Serratia marcescens*	Raw milk	1.10E+05	0.322	+
EN49	*Serratia marcescens*	Raw milk	2.00E+06	0.196	-
EN50	*Serratia liquefaciens*	Collection	1.50E+06	0.235	+
EN63	*Klebsiella pneumoniae*	Celery	1.80E+05	0.017	-
PS87	*Pseudomonas putida*	Fish	2.00E+03	0.026	-
PS91	*Pseudomonas putida*	Mushrooms	6.00E+03	0.026	-
15	*Brochothrix*	Minced meat	2.30E+05	0.028	-
BA5	*Bacillus sphaericus*	/	3.10E+05	0.120	-
PS90	*Pseudomonas putida*	Collection	1.80E+05	0.022	-
L139	*Jonesia denitrificans idem*	ATCC 55134T	1.10E+05	0.022	-
32	*Rhodococcus equi*	Meat-based product	4.10E+05	0.020	-
41	*Lactobacillus fermentum*	ATCC 9338	3.60E+05	0.023	-
	Lactobacillus plantarum	Collection	2.00E+05	0.027	-
37	*Corynebacterium flavescens*	ATCC10340	2.10E+05	0.021	-
38	*Corynebacterium variabilis*	ATCC 15753	1.30E+06	0.058	-
ST Ep	*Staphylococcus epidermidis*	Collection	5.00E+05	0.020	-
ST17	*Staphylococcus aureus*	Frozen yoghurt	6.90E+05	0.033	-
ST12	*Staphylococcus hyicus*	Meat product	4.90E+05	0.036	-
R1	*Rhodococcus equi*	Collection	5.10E+05	0.049	-
E13	*Streptococcus bovis*	CIP 5623	9.30E+04	0.023	-

Reference	Strain	Inoculation rate in 225 mL enrichment broth	Reference method					Méthode alternative en RELM				
			Fraser 1/2		Fraser		Result	RayAl Listeria		Confirmations		Final result
			PAL	OAA	PAL	OAA		OD_{450}	Test result	AL	RLM	
EN49	*Serratia marcescens*	2.00E+06	Ø	Ø	Ø	Ø	-	0.043	-	/	/	-
EN50	*Serratia liquefaciens*	1.50E+06	Ø	Ø	Ø	Ø	-	0.059	-	/	/	-

APPENDIX D :

INTERLABORATORY STUDY
-
LIST AND DETAILED RESULTS OF PARTICIPANT LABORATORIES

List of participating laboratories

Laboratory	Address
ALcontrol Laboratories (Newton Abbot)	Food Microbiology Pullman House, 7 Battlefield Road Heathfield, Newton Abbot Devonshire TQ12 6RY
ALcontrol Laboratories (Dunstable)	Food Microbiology Unit 16 Apex Business Park Boscombe Road Dunstable Bedfordshire, LU5 4SB
Bakkavor	Laboratory Manager Bakkavor Central Lab Sluice Road Holbeach St Marks Lincolnshire PE12 8HF
Eurofins Cervac Ouest - Rennes	ZAC Des Monts Gaultier 33, rue Lavoisier 35230 Noyal-Chatillion SUR SEICHE France
Eurofins Scientific (Ireland)	Science Services Center Finnabair Industrial Park Dundalk IRELAND
Eclipse Scientific Group (Telford)	Oakland House Horton Wood 35 Telford Shropshire TF1 7FR
Eclipse Scientific Group (Chatteris)	Medcalfe Way Bridge Street Chatteris Cambridgeshire PE16 6QZ
Exova Grimsby	The Technical Centre Wickham Road Grimsby North East Lincolnshire DN31 3SW
Express Microbiology	Unit 22/24 Mill Road Industrial Estate Linlithgow EH49 7SF
Food Analytical Laboratories Ltd	The Old Mill 81 Oxford Road Fegg Hayes Stoke-on-Trent ST6 6QP
Oscar Mayer	Rowan Foods Ash Road South Wrexham Industrial Estate Wrexham LL13 9UG
Kerry Foods (IRELAND)	Central Laboratory Charleville County Cork IRELAND
Kerry Ingredients	DFI Central Micro Lab 20 Dragons Court Crofts End Road, St George Bristol BS5 7XX
LASAT	ZI Montplaisir 79220 Champdenniers S Denis France

Laboratory B

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.014	-	-	-	-	=
2	-	-	-	-	-	=	0.011	-	-	-	-	=
7	-	-	-	-	-	=	0.012	-	-	-	-	=
8	-	-	-	-	-	=	0.016	-	-	-	-	=
15	-	-	-	-	-	=	0.090	-	-	-	-	=
16	-	-	-	-	-	=	0.090	-	-	-	-	=
23	-	-	-	-	-	=	0.012	-	-	-	-	=
24	-	-	-	-	-	=	0.024	-	-	-	-	=
3	+	+	+	+	+	=	3.195	+	+	+	+	=
4	+	+	+	+	+	=	3.188	+	+	+	+	=
9	+	+	+	+	+	=	3.079	+	+	+	+	=
10	+	+	+	+	+	=	3.092	+	+	+	+	=
13	+	+	+	+	+	=	3.107	+	+	+	+	=
14	+	+	+	+	+	=	3.100	+	+	+	+	=
21	+	+	+	+	+	=	3.071	+	+	+	+	=
22	+	+	+	+	+	=	3.087	+	+	+	+	=
5	+	+	+	+	+	=	3.198	+	+	+	+	=
6	+	+	+	+	+	=	3.121	+	+	+	+	=
11	+	+	+	+	+	=	3.067	+	+	+	+	=
12	+	+	+	+	+	=	3.088	+	+	+	+	=
17	+	+	+	+	+	=	3.044	+	+	+	+	=
18	+	+	+	+	+	=	3.128	+	+	+	+	=
19	+	+	+	+	+	=	3.067	+	+	+	+	=
20	+	+	+	+	+	=	3.083	+	+	+	+	=

Enumeration of the milk (CFU/mL): <1

Laboratory C

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.011	-	-	-	-	=
2	-	-	-	-	-	=	0.016	-	-	-	-	=
7	-	-	-	-	-	=	0.015	-	-	-	-	=
8	-	-	-	-	-	=	0.010	-	-	-	-	=
15	-	-	-	-	-	=	0.022	-	-	-	-	=
16	-	-	-	-	-	=	0.023	-	-	-	-	=
23	-	-	-	-	-	=	0.009	-	-	-	-	=
24	-	-	-	-	-	=	0.012	-	-	-	-	=
3	+	+	+	+	+	=	3.173	+	+	+	+	=
4	+	+	+	+	+	=	3.192	+	+	+	+	=
9	+	+	+	+	+	=	3.179	+	+	+	+	=
10	+	+	+	+	+	=	3.157	+	+	+	+	=
13	+	+	+	+	+	=	3.234	+	+	+	+	=
14	+	+	+	+	+	=	3.131	+	+	+	+	=
21	+	+	+	+	+	=	3.051	+	+	+	+	=
22	+	+	+	+	+	=	3.202	+	+	+	+	=
5	+	+	+	+	+	=	3.240	+	+	+	+	=
6	+	+	+	+	+	=	3.177	+	+	+	+	=
11	+	+	+	+	+	=	3.214	+	+	+	+	=
12	+	+	+	+	+	=	3.180	+	+	+	+	=
17	+	+	+	+	+	=	3.024	+	+	+	+	=
18	+	+	+	+	+	=	3.041	+	+	+	+	=
19	+	+	+	+	+	=	3.014	+	+	+	+	=
20	+	+	+	+	+	=	2.998	+	+	+	+	=

Enumeration of the milk (CFU/mL): <1

Laboratory D

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.049	-	-	-	-	=
2	-	-	-	-	-	=	0.054	-	-	-	-	=
7	-	-	-	-	-	=	0.052	-	-	-	-	=
8	-	-	-	-	-	=	0.048	-	-	-	-	=
15	-	-	-	-	-	=	0.046	-	-	-	-	=
16	-	-	-	-	-	=	0.050	-	-	-	-	=
23	-	-	-	-	-	=	0.057	-	-	-	-	=
24	-	-	-	-	-	=	0.053	-	-	-	-	=
3	+	+	+	+	+	=	3.001	+	+	+	+	=
4	+	+	+	+	+	=	3.014	+	+	+	+	=
9	+	+	+	+	+	=	2.885	+	+	+	+	=
10	+	+	+	+	+	=	3.068	+	+	+	+	=
13	+	+	+	+	+	=	3.014	+	+	+	+	=
14	+	+	+	+	+	=	3.088	+	+	+	+	=
21	+	+	+	+	+	=	3.033	+	+	+	+	=
22	+	+	+	+	+	=	2.961	+	+	+	+	=
5	+	+	+	+	+	=	3.097	+	+	+	+	=
6	+	+	+	+	+	=	3.036	+	+	+	+	=
11	+	+	+	+	+	=	3.011	+	+	+	+	=
12	+	+	+	+	+	=	3.022	+	+	+	+	=
17	+	+	+	+	+	=	2.942	+	+	+	+	=
18	+	+	+	+	+	=	2.866	+	+	+	+	=
19	+	+	+	+	+	=	3.042	+	+	+	+	=
20	+	+	+	+	+	=	3.017	+	+	+	+	=

Enumeration of the milk (CFU/mL): <10

Laboratory E

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.080	-	-	-	-	=
2	-	-	-	-	-	=	0.005	-	-	-	-	=
7	-	-	-	-	-	=	0.011	-	-	-	-	=
8	-	-	-	-	-	=	0.014	-	-	-	-	=
15	-	-	-	-	-	=	0.012	-	-	-	-	=
16	-	-	-	-	-	=	0.013	-	-	-	-	=
23	-	-	-	-	-	=	0.014	-	-	-	-	=
24	-	-	-	-	-	=	0.019	-	-	-	-	=
3	+	+	+	+	+	=	2.995	+	+	+	+	=
4	+	+	+	+	+	=	2.997	+	+	+	+	=
9	+	+	+	+	+	=	3.035	+	+	+	+	=
10	+	+	+	+	+	=	3.021	+	+	+	+	=
13	+	+	+	+	+	=	3.064	+	+	+	+	=
14	+	+	+	+	+	=	3.038	+	+	+	+	=
21	+	+	+	+	+	=	3.065	+	+	+	+	=
22	+	+	+	+	+	=	2.914	+	+	+	+	=
5	+	+	+	+	+	=	3.016	+	+	+	+	=
6	+	+	+	+	+	=	3.033	+	+	+	+	=
11	+	+	+	+	+	=	2.908	+	+	+	+	=
12	+	+	+	+	+	=	3.033	+	+	+	+	=
17	+	+	+	+	+	=	2.991	+	+	+	+	=
18	+	+	+	+	+	=	2.994	+	+	+	+	=
19	+	+	+	+	+	=	3.015	+	+	+	+	=
20	+	+	+	+	+	=	3.049	+	+	+	+	=

Enumeration of the milk (CFU/mL): 390

Laboratory F

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.021	-	-	-	-	=
2	-	-	-	-	-	=	0.030	-	-	-	-	=
7	-	-	-	-	-	=	0.025	-	-	-	-	=
8	-	-	-	-	-	=	0.020	-	-	-	-	=
15	-	-	-	-	-	=	0.023	-	-	-	-	=
16	-	-	-	-	-	=	0.019	-	-	-	-	=
23	-	-	-	-	-	=	0.025	-	-	-	-	=
24	-	-	-	-	-	=	0.025	-	-	-	-	=
3	+	+	+	+	+	=	3.429	+	+	+	+	=
4	+	+	+	+	+	=	>5	+	+	+	+	=
9	+	+	+	+	+	=	3.436	+	+	+	+	=
10	+	+	+	+	+	=	3.438	+	+	+	+	=
13	+	+	+	+	+	=	3.444	+	+	+	+	=
14	+	+	+	+	+	=	3.354	+	+	+	+	=
21	+	+	+	+	+	=	3.314	+	+	+	+	=
22	+	+	+	+	+	=	3.310	+	+	+	+	=
5	+	+	+	+	+	=	>5	+	+	+	+	=
6	+	+	+	+	+	=	3.395	+	+	+	+	=
11	+	+	+	+	+	=	3.401	+	+	+	+	=
12	+	+	+	+	+	=	3.407	+	+	+	+	=
17	+	+	+	+	+	=	3.304	+	+	+	+	=
18	+	+	+	+	+	=	3.329	+	+	+	+	=
19	+	+	+	+	+	=	3.298	+	+	+	+	=
20	+	+	+	+	+	=	3.293	+	+	+	+	=

Enumeration of the milk (CFU/mL): <10

Laboratory G

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.040	-	-	-	-	=
2	-	-	-	-	-	=	0.020	-	-	-	-	=
7	-	-	-	-	-	=	0.012	-	-	-	-	=
8	-	-	-	-	-	=	0.008	-	-	-	-	=
15	-	-	-	-	-	=	0.015	-	-	-	-	=
16	-	-	-	-	-	=	0.006	-	-	-	-	=
23	-	-	-	-	-	=	0.004	-	-	-	-	=
24	-	-	-	-	-	=	0.017	-	-	-	-	=
3	+	+	+	+	+	=	2.998	+	+	+	+	=
4	+	+	+	+	+	=	3.016	+	+	+	+	=
9	+	+	+	+	+	=	3.083	+	+	+	+	=
10	+	+	+	+	+	=	2.984	+	+	+	+	=
13	+	+	+	+	+	=	2.976	+	+	+	+	=
14	+	+	+	+	+	=	3.135	+	+	+	+	=
21	+	+	+	+	+	=	3.087	+	+	+	+	=
22	+	+	+	+	+	=	3.052	+	+	+	+	=
5	+	+	+	+	+	=	3.021	+	+	+	+	=
6	+	+	+	+	+	=	3.001	+	+	+	+	=
11	+	+	+	+	+	=	3.001	+	+	+	+	=
12	+	+	+	+	+	=	2.985	+	+	+	+	=
17	+	+	+	+	+	=	3.090	+	+	+	+	=
18	+	+	+	+	+	=	3.099	+	+	+	+	=
19	+	+	+	+	+	=	3.034	+	+	+	+	=
20	+	+	+	+	+	=	3.015	+	+	+	+	=

Enumeration of the milk (CFU/mL): <10

Laboratory H

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.018	-	-	-	-	=
2	-	-	-	-	-	=	0.021	-	-	-	-	=
7	-	-	-	-	-	=	0.015	-	-	-	-	=
8	-	-	-	-	-	=	0.012	-	-	-	-	=
15	-	-	-	-	-	=	0.033	-	-	-	-	=
16	-	-	-	-	-	=	0.011	-	-	-	-	=
23	-	-	-	-	-	=	0.017	-	-	-	-	=
24	-	-	-	-	-	=	0.015	-	-	-	-	=
3	+	+	+	+	+	=	3.123	+	+	+	+	=
4	+	+	+	+	+	=	3.161	+	+	+	+	=
9	+	+	+	+	+	=	2.956	+	+	+	+	=
10	+	+	+	+	+	=	3.048	+	+	+	+	=
13	+	+	+	+	+	=	3.055	+	+	+	+	=
14	+	+	+	+	+	=	2.911	+	+	+	+	=
21	+	+	+	+	+	=	3.062	+	+	+	+	=
22	+	+	+	+	+	=	2.907	+	+	+	+	=
5	+	+	+	+	+	=	3.049	+	+	+	+	=
6	+	+	+	+	+	=	2.684	+	+	+	+	=
11	+	+	+	+	+	=	3.018	+	+	+	+	=
12	+	+	+	+	+	=	2.969	+	+	+	+	=
17	+	+	+	+	+	=	2.988	+	+	+	+	=
18	+	+	+	+	+	=	3.077	+	+	+	+	=
19	+	+	+	+	+	=	3.038	+	+	+	+	=
20	+	+	+	+	+	=	2.991	+	+	+	+	=

Enumeration of the milk (CFU/mL): <10

Laboratory J

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.017	-	-	-	-	=
2	-	-	-	-	-	=	0.019	-	-	-	-	=
7	-	-	-	-	-	=	0.090	-	-	-	-	=
8	-	-	-	-	-	=	0.015	-	-	-	-	=
15	-	-	-	-	-	=	0.015	-	-	-	-	=
16	-	-	-	-	-	=	0.024	-	-	-	-	=
23	-	-	-	-	-	=	0.021	-	-	-	-	=
24	-	-	-	-	-	=	0.014	-	-	-	-	=
3	+	+	+	+	+	=	5.000	+	+	+	+	=
4	+	+	+	+	+	=	5.000	+	+	+	+	=
9	+	+	+	+	+	=	5.000	+	+	+	+	=
10	+	+	+	+	+	=	5.000	+	+	+	+	=
13	+	+	+	+	+	=	5.000	+	+	+	+	=
14	+	+	+	+	+	=	5.000	+	+	+	+	=
21	+	+	+	+	+	=	5.000	+	+	+	+	=
22	+	+	+	+	+	=	5.000	+	+	+	+	=
5	+	+	+	+	+	=	5.000	+	+	+	+	=
6	+	+	+	+	+	=	5.000	+	+	+	+	=
11	+	+	+	+	+	=	5.000	+	+	+	+	=
12	+	+	+	+	+	=	5.000	+	+	+	+	=
17	+	+	+	+	+	=	5.000	+	+	+	+	=
18	+	+	+	+	+	=	5.000	+	+	+	+	=
19	+	+	+	+	+	=	5.000	+	+	+	+	=
20	+	+	+	+	+	=	5.000	+	+	+	+	=

Enumeration of the milk (CFU/mL): <1

Laboratory L

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	/	-	-	-	-	=
2	-	-	-	-	-	=	/	-	-	-	-	=
7	-	-	-	-	-	=	/	-	-	-	-	=
8	-	-	-	-	-	=	/	-	-	-	-	=
15	-	-	-	-	-	=	/	-	-	-	-	=
16	-	-	-	-	-	=	/	-	-	-	-	=
23	-	-	-	-	-	=	/	-	-	-	-	=
24	-	-	-	-	-	=	/	-	-	-	-	=
3	+	+	+	+	+	=	3.099	+	+	+	+	=
4	+	+	+	+	+	=	3.106	+	+	+	+	=
9	+	+	+	+	+	=	3.040	+	+	+	+	=
10	+	+	+	+	+	=	3.044	+	+	+	+	=
13	+	+	+	+	+	=	3.090	+	+	+	+	=
14	+	+	+	+	+	=	3.122	+	+	+	+	=
21	+	+	+	+	+	=	3.100	+	+	+	+	=
22	+	+	+	+	+	=	3.146	+	+	+	+	=
5	+	+	+	+	+	=	3.144	+	+	+	+	=
6	+	+	+	+	+	=	3.049	+	+	+	+	=
11	+	+	+	+	+	=	3.031	+	+	+	+	=
12	+	+	+	+	+	=	3.090	+	+	+	+	=
17	+	+	+	+	+	=	3.087	+	+	+	+	=
18	+	+	+	+	+	=	3.066	+	+	+	+	=
19	+	+	+	+	+	=	3.050	+	+	+	+	=
20	+	+	+	+	+	=	3.045	+	+	+	+	=

Enumeration of the milk (CFU/mL): 50 / : not communicated

Laboratory M

Code	Reference method ISO 11290-1 #					Comparison / Expected result	Alternative method RayAl Listeria					Comparison / Expected result
	F1/2		F1		Result		OD_{450nm}	Test result	Confirmation O&A	Confirmation RapidL'mono	Result	
	O & A	Palcam	O & A	Palcam								
1	-	-	-	-	-	=	0.079	-	-	-	-	=
2	-	-	-	-	-	=	0.017	-	-	-	-	=
7	-	-	-	-	-	=	0.015	-	-	-	-	=
8	-	-	-	-	-	=	0.014	-	-	-	-	=
15	-	-	-	-	-	=	0.043	-	-	-	-	=
16	-	-	-	-	-	=	0.014	-	-	-	-	=
23	-	-	-	-	-	=	0.038	-	-	-	-	=
24	-	-	-	-	-	=	0.015	-	-	-	-	=
3	+	+	+	+	+	=	>3	+	+	+	+	=
4	+	+	+	+	+	=	>3	+	+	+	+	=
9	+	+	+	+	+	=	>3	+	+	+	+	=
10	+	+	+	+	+	=	>3	+	+	+	+	=
13	+	+	+	+	+	=	>3	+	+	+	+	=
14	+	+	+	+	+	=	>3	+	+	+	+	=
21	+	+	+	+	+	=	>3	+	+	+	+	=
22	+	+	+	+	+	=	>3	+	+	+	+	=
5	+	+	+	+	+	=	>3	+	+	+	+	=
6	+	+	+	+	+	=	>3	+	+	+	+	=
11	+	+	+	+	+	=	>3	+	+	+	+	=
12	+	+	+	+	+	=	>3	+	+	+	+	=
17	+	+	+	+	+	=	>3	+	+	+	+	=
18	+	+	+	+	+	=	>3	+	+	+	+	=
19	+	+	+	+	+	=	>3	+	+	+	+	=
20	+	+	+	+	+	=	>3	+	+	+	+	=

Enumeration of the milk (CFU/mL): NC*

*NC : not communicated

APPENDIX E :

INTERLABORATORY STUDY
-
ACCORDANCE

ACCORDANCE

ALTERNATIVE METHOD

Level L0

Laboratory	Nb of negatives expected	Nb of negatives obtained	Probability of negatives	Probability of negatives pairs	Probability of positives	Probability of positive pairs	Probability of identical result pairs
B	8	8	1.00	1.00	0.00	0.00	1.00
C	8	8	1.00	1.00	0.00	0.00	1.00
D	8	8	1.00	1.00	0.00	0.00	1.00
E	8	8	1.00	1.00	0.00	0.00	1.00
F	8	8	1.00	1.00	0.00	0.00	1.00
G	8	8	1.00	1.00	0.00	0.00	1.00
H	8	8	1.00	1.00	0.00	0.00	1.00
J	8	8	1.00	1.00	0.00	0.00	1.00
L	8	8	1.00	1.00	0.00	0.00	1.00
M	8	8	1.00	1.00	0.00	0.00	1.00
						Mean :	**1.00**
						Accordance :	**100%**

Level L1

Laboratory	Nb of positives expected	Nb of positives obtained	Probability of positives	Probability of positives pairs	Probability of negatives	Probability of negative pairs	Probability of identical result pairs
B	8	8	1.00	1.00	0.00	0.00	1.00
C	8	8	1.00	1.00	0.00	0.00	1.00
D	8	8	1.00	1.00	0.00	0.00	1.00
E	8	8	1.00	1.00	0.00	0.00	1.00
F	8	8	1.00	1.00	0.00	0.00	1.00
G	8	8	1.00	1.00	0.00	0.00	1.00
H	8	8	1.00	1.00	0.00	0.00	1.00
J	8	8	1.00	1.00	0.00	0.00	1.00
L	8	8	1.00	1.00	0.00	0.00	1.00
M	8	8	1.00	1.00	0.00	0.00	1.00
						Mean :	**1.00**
						Accordance :	**100%**

Level L2

Laboratory	Nb of positives expected	Nb of positives obtained	Probability of positives	Probability of positives pairs	Probability of negatives	Probability of negative pairs	Probability of identical result pairs
B	8	8	1.00	1.00	0.00	0.00	1.00
C	8	8	1.00	1.00	0.00	0.00	1.00
D	8	8	1.00	1.00	0.00	0.00	1.00
E	8	8	1.00	1.00	0.00	0.00	1.00
F	8	8	1.00	1.00	0.00	0.00	1.00
G	8	8	1.00	1.00	0.00	0.00	1.00
H	8	8	1.00	1.00	0.00	0.00	1.00
J	8	8	1.00	1.00	0.00	0.00	1.00
L	8	8	1.00	1.00	0.00	0.00	1.00
M	8	8	1.00	1.00	0.00	0.00	1.00
						Mean :	**1.00**
						Accordance :	**100%**

ACCORDANCE

REFERENCE METHOD

Level L0

Laboratory	Nb of negatives expected	Nb of negatives obtained	Probability of negatives	Probability of negatives pairs	Probability of positives	Probability of positive pairs	Probability of identical result pairs
B	8	8	1.00	1.00	0.00	0.00	1.00
C	8	8	1.00	1.00	0.00	0.00	1.00
D	8	8	1.00	1.00	0.00	0.00	1.00
E	8	8	1.00	1.00	0.00	0.00	1.00
F	8	8	1.00	1.00	0.00	0.00	1.00
G	8	8	1.00	1.00	0.00	0.00	1.00
H	8	8	1.00	1.00	0.00	0.00	1.00
J	8	8	1.00	1.00	0.00	0.00	1.00
L	8	8	1.00	1.00	0.00	0.00	1.00
M	8	8	1.00	1.00	0.00	0.00	1.00
						Mean :	**1.00**
						Accordance :	**100%**

Level L1

Laboratory	Nb of positives expected	Nb of positives obtained	Probability of positives	Probability of positives pairs	Probability of negatives	Probability of negative pairs	Probability of identical result pairs
B	8	8	1.00	1.00	0.00	0.00	1.00
C	8	8	1.00	1.00	0.00	0.00	1.00
D	8	8	1.00	1.00	0.00	0.00	1.00
E	8	8	1.00	1.00	0.00	0.00	1.00
F	8	8	1.00	1.00	0.00	0.00	1.00
G	8	8	1.00	1.00	0.00	0.00	1.00
H	8	8	1.00	1.00	0.00	0.00	1.00
J	8	8	1.00	1.00	0.00	0.00	1.00
L	8	8	1.00	1.00	0.00	0.00	1.00
M	8	8	1.00	1.00	0.00	0.00	1.00
						Mean :	**1.00**
						Accordance :	**100%**

Level L2

Laboratory	Nb of positives expected	Nb of positives obtained	Probability of positives	Probability of positives pairs	Probability of negatives	Probability of negative pairs	Probability of identical result pairs
B	8	8	1.00	1.00	0.00	0.00	1.00
C	8	8	1.00	1.00	0.00	0.00	1.00
D	8	8	1.00	1.00	0.00	0.00	1.00
E	8	8	1.00	1.00	0.00	0.00	1.00
F	8	8	1.00	1.00	0.00	0.00	1.00
G	8	8	1.00	1.00	0.00	0.00	1.00
H	8	8	1.00	1.00	0.00	0.00	1.00
J	8	8	1.00	1.00	0.00	0.00	1.00
L	8	8	1.00	1.00	0.00	0.00	1.00
M	8	8	1.00	1.00	0.00	0.00	1.00
						Mean :	**1.00**
						Accordance :	**100%**

APPENDIX F:

INTERLABORATORY STUDY
-
CONCORDANCE

CONCORDANCE

ALTERNATIVE METHOD

Number of laboratories 10
Number of negatives per laboratory 8

Level L0

Laboratory	Nb of negative expected	Nb of negative obtained	Inter-laboratory pairs with the same result	Total number of inter-laboratory pairs
B	8	8	576	576
C	8	8	576	576
D	8	8	576	576
E	8	8	576	576
F	8	8	576	576
G	8	8	576	576
H	8	8	576	576
J	8	8	576	576
L	8	8	576	576
M	8	8	576	576
Total			**5760**	**5760**
Concordance	100.00%			

Number of laboratories 10
Number of positives per laboratory 8

Level L1

Laboratory	Nb of positives expected	Nb of positives obtained	Inter-laboratory pairs with the same result	Total number of inter-laboratory pairs
B	8	8	576	576
C	8	8	576	576
D	8	8	576	576
E	8	8	576	576
F	8	8	576	576
G	8	8	576	576
H	8	8	576	576
J	8	8	576	576
L	8	8	576	576
M	8	8	576	576
Total			**5760**	**5760**
Concordance	100.00%			

Number of laboratories 10
Number of positives per laboratory 8

Level L2

Laboratory	Nb of positives expected	Nb of positives obtained	Inter-laboratory pairs with the same result	Total number of inter-laboratory pairs
B	8	8	576	576
C	8	8	576	576
D	8	8	576	576
E	8	8	576	576
F	8	8	576	576
G	8	8	576	576
H	8	8	576	576
J	8	8	576	576
L	8	8	576	576
M	8	8	576	576
Total			**5760**	**5760**
Concordance	100.00%			

CONCORDANCE

REFERENCE METHOD

Number of laboratories 10
Number of negatives per laboratory 8

Level L0

Laboratory	Nb of negative expected	Nb of negative obtained	Inter-laboratory pairs with the same result	Total number of inter-laboratory pairs
B	8	8	576	576
C	8	8	576	576
D	8	8	576	576
E	8	8	576	576
F	8	8	576	576
G	8	8	576	576
H	8	8	576	576
J	8	8	576	576
L	8	8	576	576
M	8	8	576	576
Total			**5760**	**5760**
Concordance	100.00%			

Number of laboratories 10
Number of positives per laboratory 8

Level L1

Laboratory	Nb of positives expected	Nb of positives obtained	Inter-laboratory pairs with the same result	Total number of inter-laboratory pairs
B	8	8	576	576
C	8	8	576	576
D	8	8	576	576
E	8	8	576	576
F	8	8	576	576
G	8	8	576	576
H	8	8	576	576
J	8	8	576	576
L	8	8	576	576
M	8	8	576	576
Total			**5760**	**5760**
Concordance	100.00%			

Number of laboratories 10
Number of positives per laboratory 8

Level L2

Laboratory	Nb of positives expected	Nb of positives obtained	Inter-laboratory pairs with the same result	Total number of inter-laboratory pairs
B	8	8	576	576
C	8	8	576	576
D	8	8	576	576
E	8	8	576	576
F	8	8	576	576
G	8	8	576	576
H	8	8	576	576
J	8	8	576	576
L	8	8	576	576
M	8	8	576	576
Total			**5760**	**5760**
Concordance	100.00%			