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NF VALIDATION:

Validation study according to the EN ISO 16140 standard

SUMMARY REPORT

**Validation study of the Reveal *Salmonella* spp
method for the detection of *Salmonella* spp
in food and environment samples**

Qualitative methods

This report includes 59 pages, with 7 annexes.
Only copies including the totality of this report are authorised.

Competences of the laboratory are certified by COFRAC accreditation for the analyses marked with symbol♦.








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Before comment

Quality Assurance documents related to this study can be consulted upon request by NEOGEN.

The technical protocol and the result interpretation were realised according to the EN ISO 16140 and the AFNOR technical rules.

-
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 - ✓ **Studied method:** **Validation of the Reveal *Salmonella* spp method for detection of *Salmonella* spp**

 - ✓ **Validation standard:** EN ISO 16140 (October 2003) : Food microbiology – Protocol for the validation of alternative methods

 - ✓ **Reference method[♦] :** NF EN ISO 6579 (2002): Horizontal method for the detection of *Salmonella* spp.

 - ✓ **Products categories:** Food products
and feeding stuffs

 - ✓ **Certification body:** AFNOR

[♦] Analyses performed according to the COFRAC accreditation

1 AIM OF THE STUDY

The validation study of Reveal *Salmonella* spp. method for the detection of *Salmonella* spp. in food products and feedstuffs was performed according to the EN ISO 16140 protocol and the AFNOR technical rules.

Five criteria were evaluated during the validation study:

- the method comparison study:
 - the practicability,
 - the inclusivity and the exclusivity,
 - the relative detection limit,
 - the relative accuracy, the relative sensitivity and the relative specificity.
- the interlaboratory study.

2 METHODS PROTOCOLS

2.1 Reference method protocol

The reference method corresponds to the ISO 6579 standard: Horizontal method for the detection of *Salmonella* spp (See Appendix 1).

2.2 Alternative method protocol

Five protocols are available depending of the sample to be tested (See Appendix 2).

The confirmations were realised by streaking the enrichment broth onto XLD or a C8-esterase activity detection based agar; the observed characteristic colonies were confirmed by the tests of the ISO 6579 method and/or by latex tests.

Enrichment storage for 72 h at 4°C was also evaluated on positive samples in order to offer sufficient practicability to the users. This was done for the positive samples in the accuracy study.

3 METHODS COMPARISON STUDY

3.1 Relative accuracy, relative specificity and relative sensitivity

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

Relative specificity is defined as the degree to which a method is affected (or not) by the other components present in a multi-component sample; that is, it is the ability of the method to measure exactly a given analyte, or its amount, within the sample without interference from non-target components such as matrix effect or background noise.

Relative sensitivity is defined as the ability of the alternative method to detect two different amounts of analyte measured by the reference method within a given matrix over the whole measurement range; that is, it is the minimal quantity variation (increase of the analyte concentration x) which gives a significant variation of the measured signal (response y).

3.1.1 Number and nature of samples

393 samples were analysed. The distribution per tested category and type is summarised below:

Table 1 - Distribution per tested category and type

Category	Type	Positive samples	Negative samples	Total
Meat	Poultry	20	4	24
	Pork	21	28	49
	Beef	5	6	11
	Total	46	38	84
Dairy	Milks and fermented milks	21	16	37
	Cheeses	10	7	17
	Dessert, milk powder, ice cream	13	12	25
	Total	44	35	79
Egg products	Dehydrated egg products	7	9	16
	Liquid egg products	8	7	15
	Egg based ready to eat food	18	17	35
	Total	33	33	66
Seafood and vegetables	Unprocessed	8	17	25
	Processed	16	5	21
	Ready to eat	43	12	55
	Total	67	34	101
Feedstuffs	Dehydrated	17	24	41
	Unprocessed	7	0	7
	Processed	9	6	15
	Total	33	30	63
Total		223	170	393

Five protocols were used depending of the samples; the distribution per protocol is summarised table 2

Table 2 - Distribution per protocol

Category	Protocol					Total
	1	2	3	4	5	
Meat	26	58	0	0	0	84
Dairy	20	0	0	5	54	79
Egg	0	0	0	0	66	66
Seafood and vegetables	76	19	0	6	0	101
Feedstuffs	12	10	41	0	0	63
Total	134	87	41	11	120	393

3.1.2 Artificial contamination of samples

Artificial contaminations were done by spiking and cross-contamination. For sample spiking, strains were stressed using various injury protocols. The injury efficiency was evaluated by comparing enumeration results onto selective and non selective agars (respectively XLD and TSYE). The artificially contaminations were performed with 46 different strains from 13 serotypes.

Globally, 223 positive samples, artificially or naturally contaminated, were analysed during the accuracy study. 172 samples were artificially contaminated; 165 gave a positive result. 60 % of the positive samples were obtained with inoculation levels lower or equal to 5 CFU/25 g.

26 % of the samples were naturally contaminated.

3.1.3 Confirmation protocols

The positive samples were confirmed by streaking the last enrichment broth (RV, Mbroth or RVS depending on the tested protocol) on XLD and Brilliance *Salmonella* Agar and by performing a latex test (*Salmonella* latex test from OXOID) directly on an isolated colony. The confirmatory tests described in the ISO 6579 method were also applied.

3.1.4 Test results

Table 3 – Paired results of the reference and alternative methods

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 187	Positive deviation (R-/A+) PD = 19
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 17 (PPND = 1)	Negative agreement (A-/R-) NA = 170 (PPNA = 9)

PP: positive presumptive non confirmed samples

Results per category of sample

Table 4 – Meat products

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 32	Positive deviation (R-/A+) PD = 7
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 7 (PPND = 1)	Negative agreement (A-/R-) NA = 38 (PPNA = 3)

Table 5 – Dairy products

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 38	Positive deviation (R-/A+) PD = 4
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 2 (PPND = 0)	Negative agreement (A-/R-) NA = 35 (PPNA = 1)

Table 6 – Egg products

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 32	Positive deviation (R-/A+) PD = 0
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 1 (PPND = 0)	Negative agreement (A-/R-) NA = 33 (PPNA = 0)

Table 7 – Seafood and vegetable products

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 56	Positive deviation (R-/A+) PD = 6
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 5 (PPND = 0)	Negative agreement (A-/R-) NA = 34 (PPNA = 2)

Table 8 – Feedstuffs

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 29	Positive deviation (R-/A+) PD = 2
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 2 (PPND = 0)	Negative agreement (A-/R-) NA = 30 (PPNA = 3)

Results per protocol**Table 9 – Protocol 1**

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 79	Positive deviation (R-/A+) PD = 7
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 7 (PPND = 1)	Negative agreement (A-/R-) NA = 41 (PPNA = 4)

Table 10 – Protocol 2

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 31	Positive deviation (R-/A+) PD = 7
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 7	Negative agreement (A-/R-) NA = 42 (PPNA = 1)

Table 11 – Protocol 3

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 14	Positive deviation (R-/A+) PD = 2
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 1	Negative agreement (A-/R-) NA = 24 (PPNA = 3)

Table 12 – Protocol 4

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 1	Positive deviation (R-/A+) PD = 3
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 0	Negative agreement (A-/R-) NA = 7

Table 13 – Protocol 5

Responses	Reference method positive (R+)	Reference method negative (R-)
Alternative method positive (A+)	Positive agreement (A+/R+) PA = 62	Positive deviation (R-/A+) PD = 0
Alternative method negative (A-)	Negative deviation (A-/R+) ND = 2	Negative agreement (A-/R-) NA = 56 (PPNA = 1)

Table 14 – Calculation of relative accuracy (AC), relative sensitivity (SE) and relative specificity (SP)

Category	PA	NA	ND	PD	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	32	38	7	7	84	83,3	39	82,1	45	84,4
Dairy products	38	35	2	4	79	92,4	40	95,0	39	89,7
Egg products	32	33	1	0	66	98,5	33	97,0	33	100,0
Seafood and vegetales	56	34	5	6	101	89,1	61	91,8	40	85,0
Feedstuffs	29	30	2	2	63	93,7	31	93,5	32	93,8
All products	187	170	17	19	393	90,8	204	91,7	189	89,9

PD = positive deviation (R-/A+)

ND = negative deviation (A-/R+)

3.1.5 Calculation of relative accuracy (AC), relative sensitivity (SE) and relative specificity (SP) (Appendix 5)

The alternative method percentage values are:

- relative accuracy : **AC = 90,8 %**
- relative specificity : **SP = 89,9 %**
- relative sensitivity : **SE = 91,7 %**

Sensitivity of both methods, when the positive deviations of the alternative method are considered, is presented below:

- alternative method = 92,4 %
- reference method = 91,5 %

3.1.6 Analysis of discordants

17 negative deviations were observed; they are listed per category in table 15:

Table 15 – Negative deviations

N° sample	Products	Contamination (Strain / level)	Reveal test result	Confirmation
4242	Marinated chicken filets	Natural	+	-
4563	Raw sausage	Natural	-	-
5179	Delicatessen (roulade)	Natural	-	-
5208	Fresh pork meat	Natural	-	-
5213	Raw pork meat	Natural	-	-
5214	Pork meat and ribs	Natural	-	-
5227	Chicken skin	Natural	-	-
327	Vanilla ice cream	Artificial (<i>Salmonella</i> Dublin Ad 531 / 4,4)	-	-
1887	Raw milk cheese	Artificial (<i>Salmonella</i> Dublin Ad 531 / 4,4)	-	-
2079	Ready to eat food	Natural (<i>Salmonella</i> Typhimurium)	-	+
4408	Fish fillet	Artificial (<i>Salmonella</i> Saintpaul F31 / 14,0)	-	-
4682	Cucumber salmon mix	Artificial (<i>Salmonella</i> Saintpaul F31 / 14,0)	-	-
37	Surimi	Artificial (<i>Salmonella</i> Agona F118 / 7,8)	-	-
39	Minced fish	Artificial (<i>Salmonella</i> Derby F81 / 1,0)	-	-
460	Mix salad	Artificial (<i>Salmonella</i> Virchow F276 / 5,0)	-	-
4698	Dehydrated poultry proteins	Natural	-	-
41	Dog pâté	Artificial (<i>Salmonella</i> Livingstone F104)	-	+ (1 colony)

For one sample (n° 4242), the Reveal test gave a positive result. While several streaking and subcultures were done on XLD, Brilliance *Salmonella* and RVS, it was impossible to confirm the presence of *Salmonella* from the enrichment broth.

For 2 samples (n° 2079 and 41), the presence of *Salmonella* was confirmed in the enrichment broth while the Reveal test gave a negative result, just a few colonies were observed on the selective agar for these two samples. The detection limit of the device was probably not reacted.

For the 14 other samples, the Reveal test and confirmatory tests gave negative results. Note that the enrichment broths were different for 13 of these samples (for protocols n° 1, 2, 3 and 4). The deviations could be thus due to the sampling heterogeneity.

Anyway, in order to check that the Reveal *Salmonella* test detects the strains isolated from the samples, the strains were grown in BHI broth and the Reveal *Salmonella* test was directly performed on the pure culture. The results are given table 16:

Table 16 – Complementary test realised on strains isolated from samples in negative deviations

N° sample	Reveal test result (accuracy study)	Reveal <i>Salmonella</i> Test result on pure culture (after growth in BHI)	Strain serotype	Contamination	Confirmation result
4242	+	+	Salmonella Indiana	natural	-
4408	-	+	Salmonella Saintpaul F81	artificial	-
4563	-	+		natural	-
4698	-	/		natural	-
5179	-	+		natural	-
5208	-	+		natural	-
5213	-	+		natural	-
5214	-	+		natural	-
5227	-	+		natural	-
37	-	+	Salmonella Agona F118	artificial	-
39	-	+	Salmonella Derby F81	artificial	-
41	-	+	Salmonella Livingstone F104	artificial	+
327	-	+	Salmonella Dublin Ad531	artificial	-
460	-	+	Salmonella Virchow F276	artificial	-
1887	-	+	Salmonella Dublin Ad531	artificial	-
2079	-	+	Salmonella Typhimurium	natural	+
4682	-	+	Salmonella Saintpaul F31	Artificial	-

/ : not available

All the strains were detected by the device. This confirms that most of the deviations were enhanced by the sampling heterogeneity.

19 positive deviations were observed; they are listed in table 17:

Table 17 – Positive deviations

N° sample	Products	Contamination
4404	Poultry meat	Natural
4541	Pork minced meat	Natural
4542	Pork minced meat	Natural
5172	Chicken hearts	Natural
5183	Ground chicken meat	Natural
5206	Pork minced meat	Natural
5215	Hen meat	Natural
381	Raspberries tiramisu	Artificial (<i>Salmonella</i> Agona)
3607	Cappuccino	Artificial (<i>Salmonella</i> Meleagridis 505)
3609	Pastry	Artificial (<i>Salmonella</i> Meleagridis 505)
3665	Pastry	Artificial (<i>Salmonella</i> Typhimurium Ad 1333)
35	Tarama	Artificial (<i>Salmonella</i> Agona F118)
2786	Cacao	Artificial (<i>Salmonella</i> Agona Ad 1483)
2788	Cereals (baby food)	Artificial (<i>Salmonella</i> Typhimurium 633)
2789	Cereals (baby food)	Artificial (<i>Salmonella</i> Typhimurium 633)
3621	Vegetables mix	Artificial (<i>Salmonella</i> mbandaka Ad 914)
3623	Sandwich	Artificial (<i>Salmonella</i> mbandaka Ad 914)
4263	Poultry powder	Natural
533	Pellets for pigs	Artificial (<i>Salmonella</i> Agona A00V038)

The McNemar test was applied:

$$Y = ND + PD = 17 + 19 = 36$$

$$d = |17 - 19| = 2$$

$$x^2 = d^2/Y = 2^2 / 36 = 0,111$$

$$x^2 < 3,841$$

The two methods are not different at $\alpha < 0,05$.

3.1.7 Confirmations

The confirmations were realised by streaking 10 μ l of the last enrichment broth onto XLD and Brilliance *Salmonella* agar plates. The *Salmonella* latex test (OXOID) was then applied on isolated colonies.

The same results were obtained on the 2 tested agar plates, except for 5 samples (n° 329, 586, 2079, 2140 and 2143); typical colonies were observed only on one of the 2 plates for:

- sample n° 329 : XLD +, Brilliance *Salmonella* -
- sample n° 586 : XLD -, Brilliance *Salmonella* +
- sample n° 2079 : XLD +, Brilliance *Salmonella* -
- sample n° 2140: XLD +, Brilliance *Salmonella* -
- sample n° 2143 : XLD +, Brilliance *Salmonella* -

3.1.8 **Enrichment broth storage at 2 - 8°C**

The positive samples enrichment broths of the alternative method were stored at 2 - 8°C for 72 h and analysed a second time.

The same results were observed before and after the enrichment broths storage.

3.2 **Relative detection level**

The relative detection level is the smallest number of culturable micro-organisms that can be detected in the sample in 50% of occasions by the alternative and reference methods.

3.2.1 **Matrices**

The objective of this study is (i) to determine the target species minimal quantity that can be detected in food matrices, (ii) to compare both method results.

Detection limits were defined by analysing the different matrix/strain pairs. Four levels were tested. Six replicates of each combination were prepared.

The following matrices were tested:

- ground beef inoculated with *Salmonella* Infantis 128,
- raw milk inoculated with *Salmonella* Typhimurium 4,
- egg product inoculated with *Salmonella* Enteritidis 657,
- ready to eat food (pasta) inoculated with *Salmonella* Anatum 6140,
- cacao inoculated with *Salmonella* Senftenberg 1,
- cat pellets inoculated with *Salmonella* Agona A00V038.

3.2.2 Contamination protocol

Contaminations and enumerations were realised according to the AFNOR technical rules (protocol for low level inoculations). The contamination levels are presented below:

- level 1: 0 UFC/g or /ml
- level 2: level necessary to obtain 0 to 50% positives,
- level 3: level necessary to obtain 50 to 75% positives,
- level 4: level necessary to obtain de 100% positives.

The samples were analysed by both methods, and the background microflora were enumerated.

3.2.3 Results

Detection levels are presented in the table 18.

Table 18 – Relative detection level results

Strain / matrix pairs	Relative detection level (CFU / 25 g) according to Spearman-Kärber test ¹	
	Reference method	Alternative method
Ground beef / <i>Salmonella</i> Infantis 128	0,3 [0,2 ; 0,4]	0,5 [0,3 ; 0,8]
Raw milk / <i>Salmonella</i> Typhimurium 4	0,4 [0,3 ; 0,7]	0,6 [0,4 ; 1,1]
Egg product / <i>Salmonella</i> Enteritidis 657	0,5 [0,3 ; 1,0]	0,5 [0,3 ; 1,0]
Ready to eat food / <i>Salmonella</i> Anatum 6140	1,0 [0,5 ; 1,8]	0,5 [0,3 ; 0,8]
Cacao / <i>Salmonella</i> Senftenberg 1	0,7 [0,3 ; 1,3]	0,8 [0,6 ; 1,0]
Cat pellets / <i>Salmonella</i> Agona A00V038	0,6 [0,3 ; 1,1]	0,8 [0,4 ; 1,6]

3.2.4 Conclusion

The relative detection level varies from 0,2 to 1,8 CFU/25 g for the reference method and from 0,3 to 1,6 CFU/25 g for the alternative method. The alternative and the standard methods show similar detection levels.

¹ "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".

3.3 Inclusivity / exclusivity

Inclusivity is the ability of the alternative method to detect the target analyte from a wide range of strains.

Exclusivity is the lack of interference from a relevant range of non-target strains of the alternative method.

3.3.1 Test protocols

- **Protocol for inclusivity**: *Salmonella* strains cultures were performed in BHI medium at 37°C. Dilutions were done in order to inoculate 10 cells/225 ml Revive medium. The alternative method protocol was then performed following protocol n° 1. The recovery of some specific strains was observed by adding 25 ml of UHT milk in the enrichment broth.
- **Protocol for exclusivity**: negative strains cultures were performed in BHI, incubated at 37°C. Dilutions were done in order to inoculate 10⁵ cell/ml BPW. The Reveal *Salmonella* test was then performed.

3.3.2 Results

Raw data are given in Appendix 4.

Among the tested 56 strains, 5 gave negative Reveal *Salmonella* test results: *Salmonella gallinarum* biovar *pallorum* Ad 300, *Salmonella* Paratyphi A ATCC 9150, ATCC 11511 and CIP 5541, and *Salmonella* Paratyphi B Ad 301. These strains were also tested by the ISO 6579 standard method; they were all detected.

Additional tests were performed with *Salmonella* Paratyphi A strains, the results are given in Appendix 5. The 4 tested strains gave negative Reveal *Salmonella* tests results.

When BHI cultures were done, weak reactions of the Reveal *Salmonella* tests were observed.

Negative Reveal *Salmonella* tests were observed for all the tested negative strains.

4 PRACTICABILITY

The Reveal *Salmonella* method practicability was evaluated according to the AFNOR technical rules.

✓ *Packaging, volume of reagents, storage conditions, and kit shelf-life*

- Revive Medium for *Salmonella* (item n° 9705) – Storage 15 – 30°C
 - * 20 bottles
 - * 20 stomacher-type bags
 - * 1 graduated cup

- Rappaport Vassiliadis Broth (2 x conc.) (item n° 9715)
Storage 15 – 30°C
 - * 20 bottles
 - * 20 stomacher-type bags
 - * 1 graduated cup

- M broth (item n° 9722) - Storage 2 – 8°C
 - * 20 bottles

- Reveal 2.0 *Salmonella* test system (item n° 9705) – Storage 15 – 30°C
 - * Devices and reagents required for 20 analyses

The shelf-life is given on each package:

- Reveal *Salmonella* 2.0 devices: 6 months
- Revive broth: 2 years
- Rappaport Vassiliadis broth: 2 years
- M broth: 4 years

✓ *Specific equipment*

No specific equipment is required.

✓ *Additional reagents*

Sterile water

✓ *Training*

Less than 1 day is required for technicians with microbiology background.

✓ *Workflow study (in minutes)*

	Reference method 30 samples	Alternative method (Protocol n°4) 30 samples
Sampling	/	30
Stomach	60	60
RV media preparation and transfer	40	40
RVS and MKTTn subcultures	/	45
Reveal Salmonella test	56	/
Streaking onto selective agar plates	94	30
Reading plates	37	/
Total / negative sample	9,6	6,8
Streaking onto selective agar plates	/	30
Reading plates	/	15
Latex test	/	15
Streaking on nutritive agar plates	25	/
Confirmatory tests	150	/
Total / positive sample	15,4	8,8

For negative and positive samples, the Reveal *Salmonella* test requires less time than the standard method.

✓ *Time to results***- Negative samples**

	ISO 6579 method	Alternative method				
		Protocol 1	Protocol 2	Protocol 3	Protocol 4	Protocol 5
Preenrichment (BPW or Revive)	Day 0	Day 0	/	Day 0	Day 0	Day 0
Enrichment 1 (RV or RVS and MKTTn)	Day 1	Day 0	Day 0	Day 0	Day 1	Day 1
Enrichment 2 (M broth)	/	/	/	Day 1	/	/
Reveal <i>Salmonella</i> test	/	Day 1	Day 1	Day 1	Day 2	Day 2
Streaking	Day 2	/	/	/	/	/
Reading	Day 3	/	/	/	/	/

- Positive samples

	ISO 6579 method	Alternative method				
		Protocol 1	Protocol 2	Protocol 3	Protocol 4	Protocol 5
Preenrichment (BPW or Revive)	Day 0	Day 0	/	Day 0	Day 0	Day 0
Enrichment 1 (RV or RVS and MKTTn)	Day 1	Day 0	Day 0	Day 0	Day 1	Day 1
Enrichment 2 (M broth)	/	/	/	Day 1	/	/
Reveal <i>Salmonella</i> test	/	Day 1	Day 1	Day 1	Day 2	Day 2
Streaking	Day 2	/	/	/	/	/
Reading	Day 3	/	/	/	/	/
Latex test	/	Day 2	Day 2	Day 2	Day 3	Day 3
Confirmatory test	Day 4 to Day 6	/	/	/	/	/

Negative results are available within 1 or 2 days depending on the protocol, and confirmed positive results are available in 2 or 3 days.

✓ *Technician background*

Technician qualified in microbiology

✓ *Steps in common with reference method*

Pre-enrichment and enrichment steps of the protocol 5 are common with the reference method.

5 INTERLABORATORY STUDY

Five protocols are available depending of the sample to test.

The confirmations were be realised by streaking the enrichment broth onto XLD or a C8-esterase activity detection based agar; the observed characteristic colonies were confirmed by the tests of the ISO 6579 method and/or by latex tests.

The protocol 2, considered as the most selective one, was tested (See Appendix 2).

5.1 Study organisation

Collaborators number

Samples were sent to 15 laboratories.

Matrix and strain used

The study was done with ground beef samples contaminated by *Salmonella* Typhimurium A00C060.

Samples

Samples were inoculated and sent on Monday 22 August 2011, as described below:

- 24 codified samples for *Salmonella* research with the Reveal *Salmonella* spp. method, weighted in a specific bag,
- 24 codified samples for *Salmonella* research with the reference method (ISO 6579:2002), weighted in a Stomacher bag,
- 1 sample for aerobic mesophilic flora enumeration with the ISO 4833 method,
- 1 water flask labelled “Temperature Control” with a sensor.

The analyses were started on Wednesday 24 August 2011.

Inoculation

The targeted inoculation levels were:

- Level 0: 0 CFU/g,
- Level 1: 5 CFU/g,
- Level 2: 25 CFU/g.

8 samples were prepared per inoculation level, per method and per laboratory. Each laboratory received 24 samples to analyse by the reference method and 24 samples to analyse by the alternative method.

Labelling and shipping

Blinded samples were placed in isothermal boxes, which contained cooling blocks, and express-shipped to the different laboratories.

A temperature control flask containing a sensor was added to the package in order to register the temperature profile during the transport, and the package delivery.

Samples were shipped in 24 h to 48 h to the involved laboratories. The temperature conditions had to stay lower or equal to 8,4°C during transport, and between 0°C – 8,4°C in the labs.

Analyses

Collaborators and ADIRA Développement carried out the analyses with the alternative and reference methods at day 2.

Expedition conditions

The collaborative study instructions were sent on July 28, 2011.

5.2 Experimental parameters control

5.2.1 Contamination level before inoculation, levels obtained after the artificial contaminations of the samples

Before inoculation

In order to detect *Salmonella*, the 6579 method was performed on five ground beef test portions (25 g) before the inoculation. All the results were negative.

Sample stability

Sample stability was checked by inoculating the matrix at 100 CFU/g and 5 CFU/g. Enumerations were performed for the high contamination level and detection analyses were performed for the low contamination level. *Triplicata* were analysed, and the results were the following:

Day	Reference method (research)			CFU/g (XLD)			Aerobic mesophilic flora (CFU/g)
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	
Day 0	-	+	+	100	40	60	9,0.10 ³
Day 1	-	+	+	60	90	60	3,6.10 ³
Day 2	+	+	-	130	70	50	4,2.10 ⁴

No evolution was observed during storage at 4°C.

Contamination levels

The contamination levels and the confidence intervals were:

Level	Samples	Theoretical target level (b/25 g)	True level (b/25 g sample)	Low limit / 25 g sample	High limit / 25 g sample
Level 0	3 – 7 – 8 – 13 – 16 – 17 – 21 – 24	/	/	/	/
Low level	1 – 6 – 10 – 11 – 14 – 18 – 22 – 23	5	2,1	1,8	2,4
High level	2 – 4 – 5 – 9 – 12 – 15 – 19 – 20	25	9,8	8,4	11,2

5.2.2 Logistic conditions

Temperature conditions are given below:

Sample temperatures at receipt

Laboratories	Temperature measured by the sensor (°C)	Temperature measured at receipt (°C)	Receipt date and time	
A	3,0	6,0	23/08/2011	11h15
B	3,5	4,5	23/08/2011	08h10
C	5,0	6,6	23/08/2011	09h06
D	<i>No information about package receipt</i>			
E	5,0	6,3	23/08/2011	09h30
F	2,0	5,2	23/08/2011	08h30
G	5,0	6,2	23/08/2011	08h15
H	4,0	6,5	23/08/2011	09h30
I	6,0	6,3	23/08/2011	11h05
J	3,0	5,6	23/08/2011	16h15
K	5,0	7,0	23/08/2011	16h15
L	6,0	5,2	23/08/2011	09h00
M	6,0	5,6	23/08/2011	
N	6,5	10,8	23/08/2011	09h00
O	3,0	4,6	23/08/2011	10h00

5.2.3 Conclusion

No problem was encountered during the transport or at receipt.

Lab D didn't do any feedback about the sample delivery, analyses, and so on.

Lab N noticed a temperature of 10,8°C at receipt, but the curve indicated that the package was at 6,5°C.

5.3 Results analysis

5.3.1 Aerobic mesophilic flora enumeration

Depending on the Lab results, the enumeration levels varied from $1,2 \cdot 10^2$ to $1,9 \cdot 10^5$ CFU/g.

5.3.2 Expert lab results

For the low contamination level, one sample (Q10) gave a negative result with the reference method. For the alternative method, all the inoculated samples gave positive results.

5.3.3 Collaborator lab results

15 Labs participated to the study. Only 14 Labs analysed the samples.

Four Labs obtained positive results for the non-inoculated samples:

- Lab A: for one sample (A21) by the reference method,
- Lab B: for five samples (B7, B13, B17, B21, B24) by the reference method,
- Lab C: for one sample (C7) by the alternative method, but the presence of *Salmonella* was not confirmed for this sample,
- Lab J: for one sample (J17) by the alternative method.

It was asked to Labs A, B and J to send back the plates, in order to verify if the *Salmonella* isolates from the control samples correspond to the inoculated strain. Only the plates from Lab A are available yet.

The results from Lab B were not taken into account, too many positive results were observed on the control samples.

One sample inoculated at the low level wasn't screened as positive with the Reveal device, while few colonies were observed with the tested confirmatory agars (Lab H).

Note that fractional recovery results were observed with the low inoculation level.

The interpretation was done with the results of 13 Labs: A, C, E, F, G, H, I, J, K, L, M, N and O.

5.4 Results interpretation

5.4.1 Specificity and sensitivity for each method

For the L0 level and for each method, specificity percentages are calculated according to:

$$SP = \left[1 - \left(\frac{FP}{N-} \right) \times 100\% \right]$$

with :N- = total number of all L0 assays

FP = number of false positive results

For each contamination level and each method, the sensitivity percentages are calculated according to:

$$SE = \frac{TP}{N+} \times 100\%$$

with :N+ = total number of all L1 or L2 assays

TP = number of true positive results

Results are reported in the following table:

Level	Reference method		Alternative method	
	SP/SE %	LCL%	SP/SE %	LCL%
L0	SP = 99,0	98	SP = 99,0	98
L1	SE = 91,3	84	SE = 93,3	88
L2	SE = 100,0	98	SE = 100,0	98
L1+L2	SE = 95,7	89	SE = 96,6	93

5.4.2 Relative accuracy (AC)

Results for all levels are given below:

Table 19 - Paired results of the alternative and reference methods

Alternative method	Reference method		Total
	+	-	
+	PA = 192	PD = 8	200
-	ND = 8	NA = 104	112
Total	N+ = 200	N- = 112	N = 312

Relative accuracy (AC) (in %) is calculated according to:

$$AC = \frac{(PA + NA)}{N} \times 100\%$$

with : N = number of samples analysed
 PA = number of positive agreement
 NA = number of negative agreement

The alternative method accuracy values with regard to the reference method are:

Table 20

Level	AC %	LCL %
L0	98,1	98,0
L1	86,5	79,8
L2	100,0	98,0
L1 + L2	93,3	88,0
Total	94,9	89,0

5.4.3 Discordant results

16 discordant results were observed between the reference and the alternative methods: 8 negative deviations and 8 positive deviations (one negative deviation and one positive deviation concern a control sample).

$$Y = PD + ND = 8 + 8 = 16$$

$$M = 3$$

$$m = 8$$

$m > M$, the two methods are not different at $\alpha 0,05$.

5.5 Interpretation

5.5.1 Comparison of the relative accuracy, specificity and sensibility values

The values obtained for the two parts of the validation study (comparative and inter-laboratory studies) are reported in table 21.

Table 21 - Alternative method values calculated during the comparative and inter-laboratory studies

	Interlaboratory study	Methods comparative study
Relative accuracy (AC)	99,4	90,8
Sensibility (SE)	96,6	91,7
Specificity (SP)	99,0	89,9

5.5.2 Accordance (DA)

Accordance values for both methods are (Appendix 6):

Level	Reference method (DA)	Alternative method (DA)
L0	98,3	98,3
L1	86,8	89,2
L2	100,0	100,0

5.5.3 Concordance

Both methods concordance values are (Appendix 7):

Level	Reference method	Alternative method
L0	98,1	98,1
L1	84,0	87,3
L2	100,0	100,0

5.5.4 Odds Ratio (COR)

The odds ratio value is determined according to:

$$COR = \frac{\text{Accordance} \times (100 - \text{agreement})}{\text{Agreement} \times (100 - \text{accordance})}$$

Both method odds ratio values are:

Level	Reference method (COR)	Alternative method (COR)
L0	1,00	1,00
L1	1,03	1,02
L2	1,00	1,00

6 CONCLUSION

For the Method Comparison Study:

The Reveal *Salmonella* test shows satisfying relative accuracy, specificity and sensitivity.

The relative detection limits of the Reveal *Salmonella* test and the ISO standard are similar.

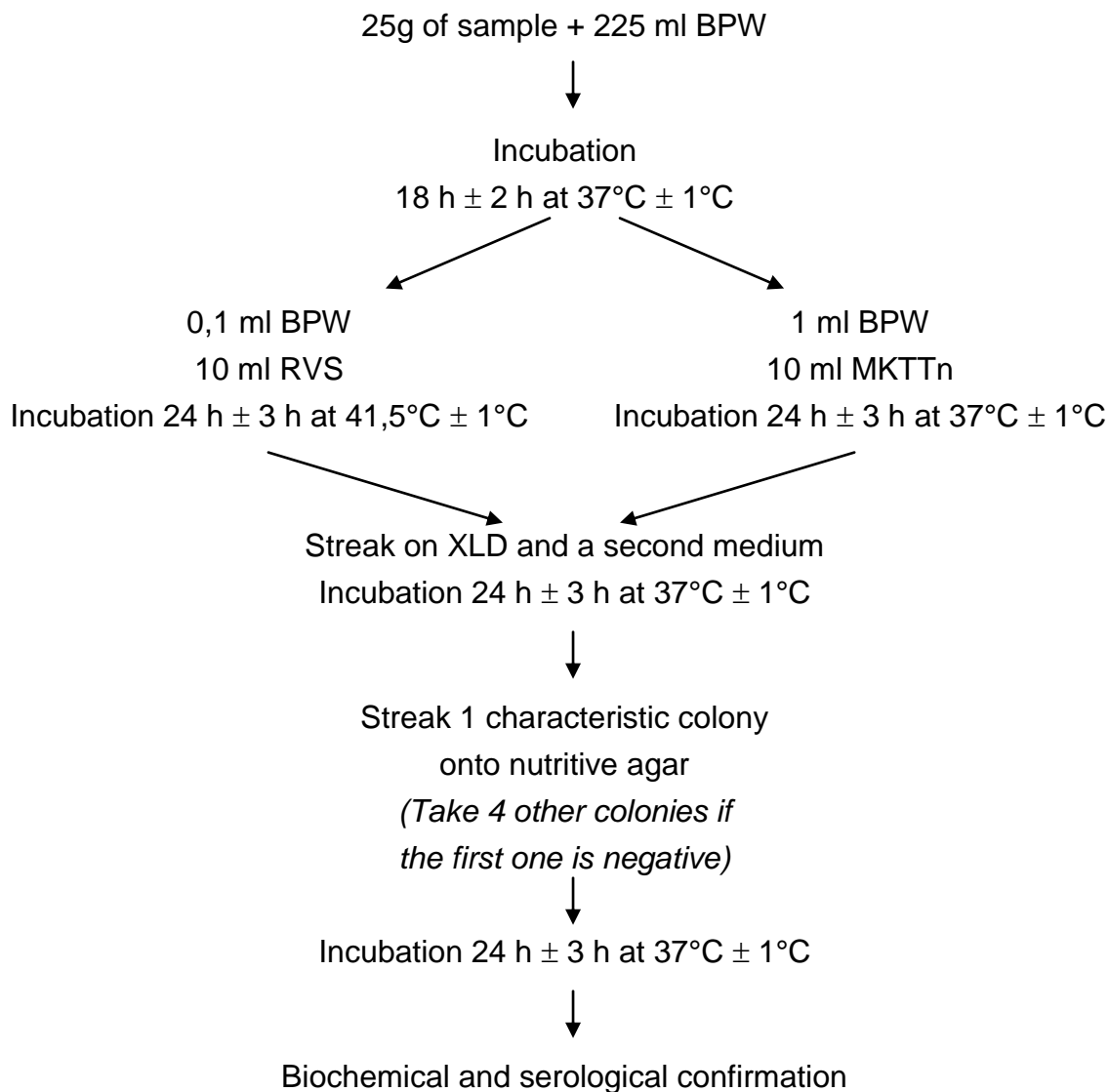
The Reveal *Salmonella* test is selective and specific, but didn't detect the tested Paratyphi A strains.

Negative results are available within one to two days using the Reveal *Salmonella* test.

For the Interlaboratory Study:

The alternative method and reference method show equivalent performances (accordance, concordance, odds ratio).

Appendix 1 - NF EN ISO 6579: 2002: Microbiology of food and animal feeding stuffs – Horizontal method for the detection of *Salmonella* spp.

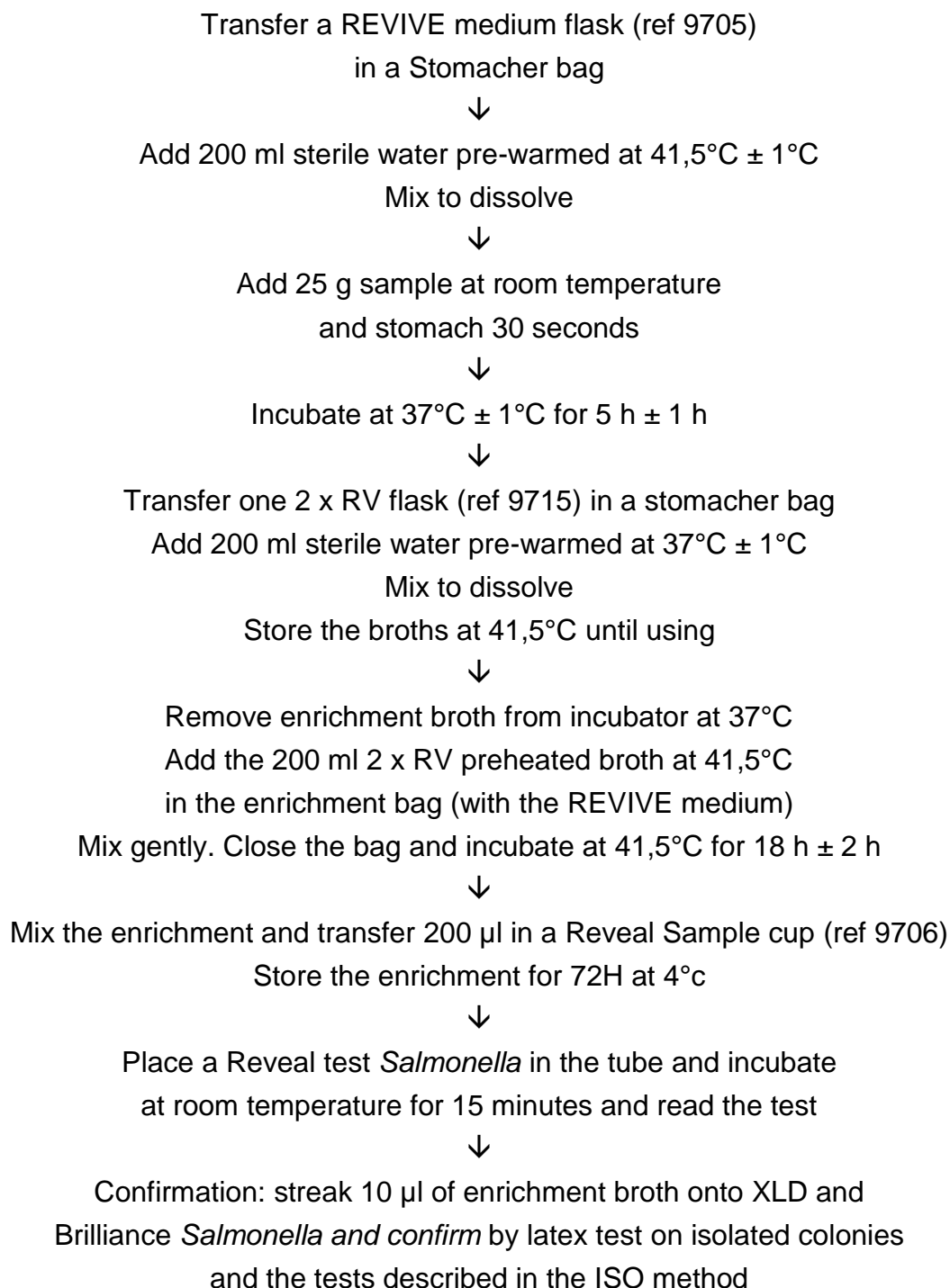


Appendix 2– Reveal *Salmonella spp.* method: new protocols

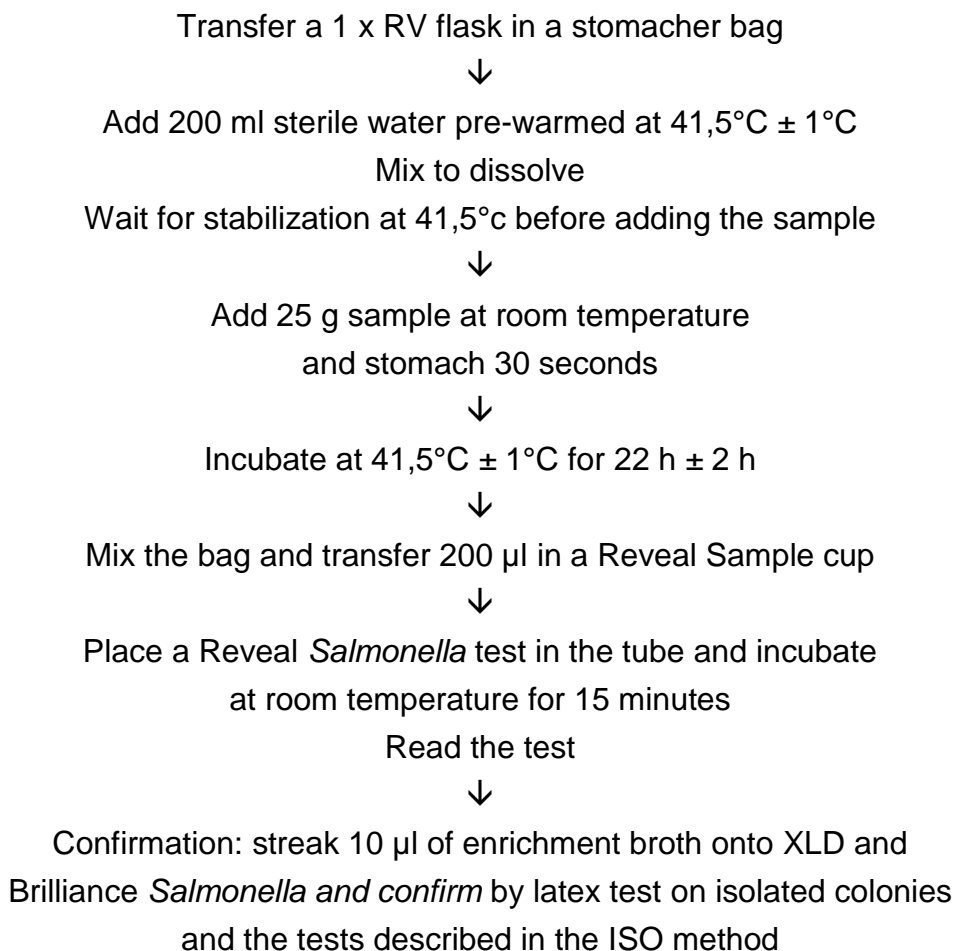
- + Protocol 1: All processed food, except low moisture products, cheeses, milks and egg products**
- + Protocol 2: All non processed food, poultry rinses, except Milks, cheeses and egg products**
- + Protocol 3: Dried pet food, highly viscous products, highly pigmented material**
- + Protocol 4: Low moisture food products: milk powder, egg powder, flours, chocolate, cocoa powder, peanut butter**
- + Protocol 5: Milks, cheeses and egg products**

Protocol 1:

All processed food, except low moisture products, cheeses, milks and egg products



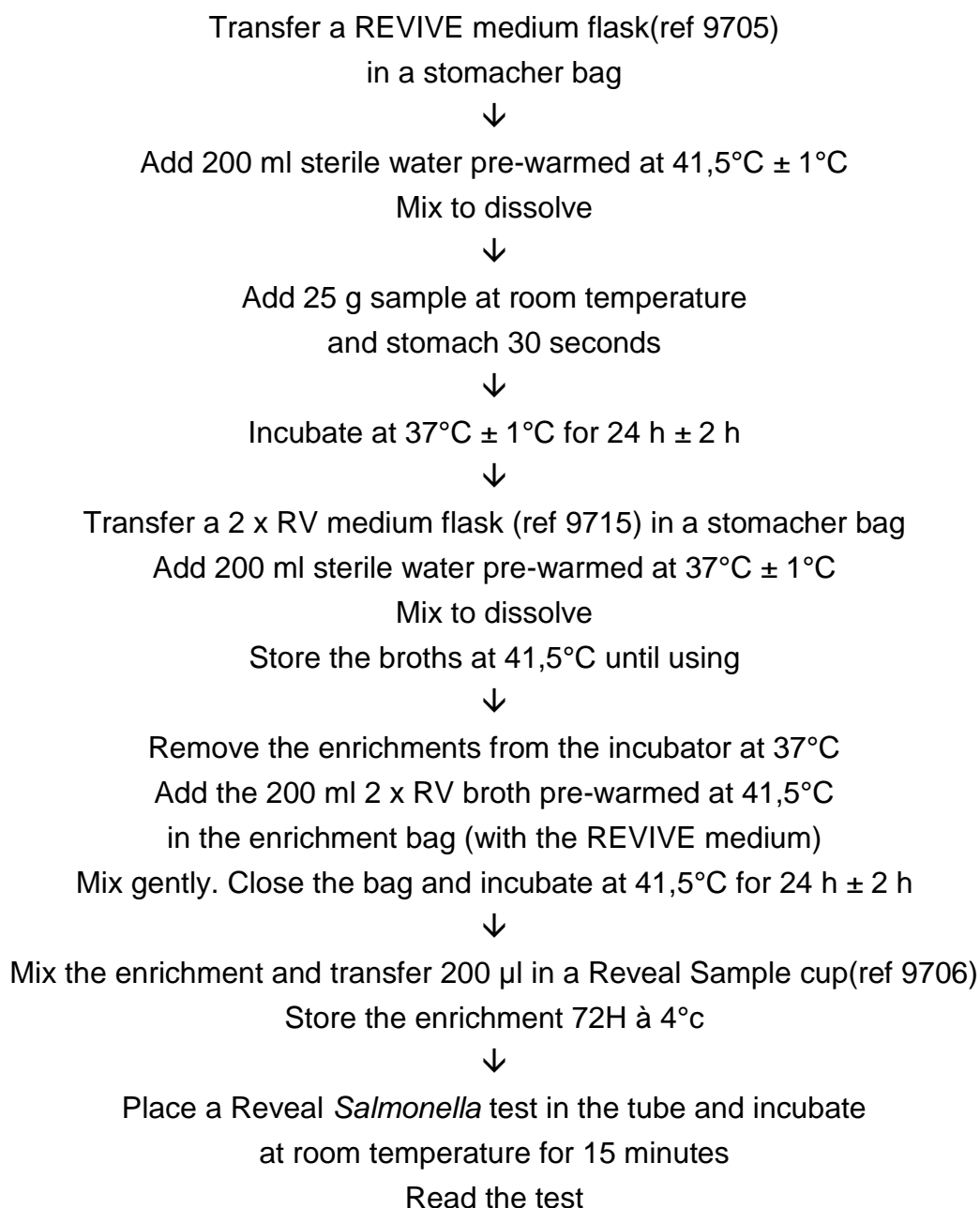
Protocol 2:
All non processed food, poultry rinses,
except milks, cheeses and egg products



Protocol 3:
Dried pet food, highly viscous products, highly pigmented material

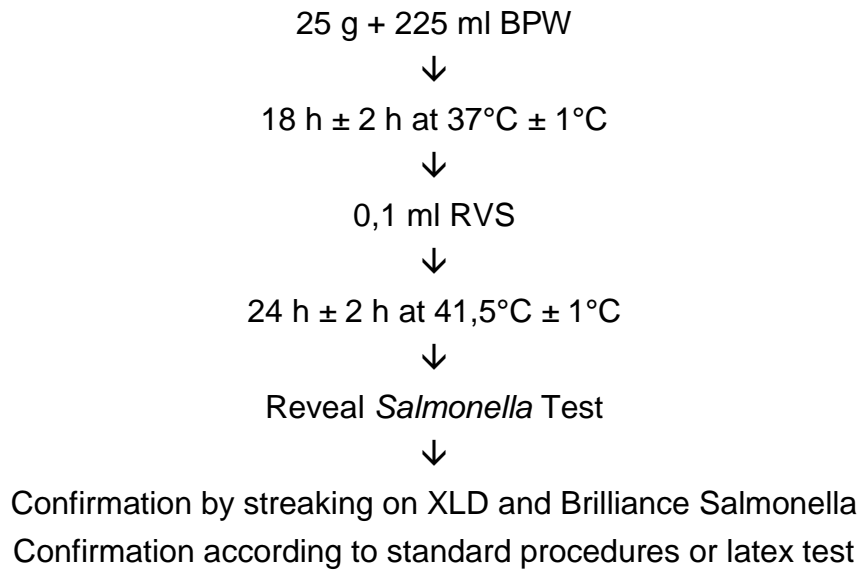
Transfer the REVIVE medium in a stomacher bag
↓
Add 200 ml sterile water pre-warmed at 41,5°C ± 1°C
Mix to dissolve
↓
Add 25 g sample at room temperature and stomach 30 seconds
↓
Incubate at 37°C ± 1°C for 5 h ± 1 h
↓
Transfer a 2 x RV medium in a stomacher bag
Add 200 ml sterile water pre-warmed at 37°C ± 1°C.
Mix to dissolve. Keep the broths at 41,5°C until using
↓
Remove the enrichments from the incubator at 37°C
Add the 200 ml 2 x RV broth pre-warmed at 41,5°C
in the enrichment bag.
Mix gently. Close the bag and incubate at 41,5°C for 18 h ± 2 h
↓
Rehydrate one flask of M broth by adding
10 ml sterile water pre-warmed at 37°C. Mix to dissolve
↓
Transfer 1 ml REVIVE + 2 x RV enrichment into the M broth
↓
Incubate at 37°C for 7 h ± 1 h
↓
Mix the enrichment and transfer 200 µl into a Reveal Sample cup
↓
Place a Reveal *Salmonella* test in the tube and incubate
at room temperature for 15 minutes
Read the test
Confirmation: streak 10 µl of enrichment broth onto XLD and
Brilliance *Salmonella* and confirm by latex test on isolated colonies
and the tests described in the ISO method

Protocol 4:
**Low moisture food products: milk powder, egg powder, flours,
chocolate, cocoa powder, peanut butter**



Confirmation: streak 10 µl of enrichment broth onto XLD and Brilliance *Salmonella* and confirm by latex test on isolated colonies and the tests described in the ISO method

Protocol 5:
Milks, cheeses and egg products



Appendix 3 – Relative accuracy: raw data

Bold typing: artificial contaminations

*: sample confirmed on MSRV

NC: non characteristic colonies on nutrient agar

+/-: doubtful colonies

ox: oxidase test

ni: non isolated colonies

MEAT PRODUCTS																					
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦					Reveal Salmonella Test								Enrichment storage during 72H-4°C				
				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
3687	Bacon	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
3689	Turkey	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
3690	Salted caul	1	-	-	-	-	-	-	+/- (very weak reaction)	+ni/+	-	E.coli	-	-	-	PPNA	-(PPNC)				
3698	Raw sausages	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
3699	Raw sausages	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
3811	Ground chicken meat	2	-	-	+(Ox+)	-	+(Ox+)	-	-	-	-	-	-	-	-	NA					
3827	Ready to eat food with beef meat	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
4242	Marinated chicken filets	1	+	+	+	+	+	+(Salmonella Indiana)	+(weak reaction)	-(X5)	-	-	-	-(X5)	-	PPND	-(PPNC)	+(weak reaction)	-	-	PPND
4245	Sausages	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
4248	Sausages	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
4253	Poultry	2	+	+ni/+	-	-	-	+	+(weak reaction)	+	+	+	+	+	+	PA	+	+	+	PA	
4254	Ground beef	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
4255	Poultry	2	-	-	-	+/- (Citrobacter freundii)	-	-	-	-	-	-	-	-	-	NA					
4395	Ready to eat food with veal	1	-	-	-	-	-	-	+(weak reaction)	-	-	-	-	-	-	PPNA	-(PPNC)				
4398	Ready to eat food (steak with green pepper)	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
4399	Liver paté	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
4400	Pork rillettes	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
4401	Moussaka	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
4402	Hachis parmentier	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
4404	Mechanically deboned poultry meat	2	+	+	+/-	+ni/-	-	-	+(weak reaction)	-(X5)	-	-	+(X5)	+	+	PD	+(weak reaction)	+	+	PD	
4541	Pork minced meat	2	+	-	-	-	-	-	+	+	+	+	+	+	+	PD	+	+	+	PD	
4542	Pork minced meat	2	+	-	-	-	-	-	+	+	+	+	+	+	+	PD	+	+	+	PD	
4543	Pork minced meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					

♦ Analysis performed according to the COFRAC accreditation

MEAT PRODUCTS																					
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦				Result	Test result	Reveal Salmonella Test						Final result	Agreement	Enrichment storage during 72H-4°C			
				RVS broth		MKTn broth				Confirmation								Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
4544	Pork minced meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
4545	Pork minced meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
4563	Raw sausage	1	+	+ni/+	-	+	+	+	-	-	-	-	-	-	-	ND	-	-	-	ND	
4663	Stuffing	1	-	-	+ni/(ox+)	+ni/+ (Citrobacter braakii)	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA	
5167	Turkey meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
5168	Chicken meat	2	+	-	-	+	+	+	+	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
5169	Turkey meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
5170	Ground chicken meat	2	+	+	+	+	+/-	+	+	-	-	+	+	+	+	PA	+	+	+	PA	
5171	Hare meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5172	Chicken hearts	2	+	+ni/+ (Citrobacter youngae)	-	+ni/+ (Citrobacter youngae)	-	-	+	+	+	+	+	+	+	PD	+	+	+	PD	
5173	Pork ground meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+(very weak reaction)	+	+	PA	
5174	Ground white meat	2	+	+	-	+	+	+	+	-	-	+	+	+	+	PA	+	+	+	PA	
5175	Turkey meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
5176	Red meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5177	Chicken meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
5178	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5179	Roulade	2	+	+	+	+	+	+	-	-	-	-	-	-	-	ND	-	-	-	ND	
5180	Turkey meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
5181	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5182	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5183	Ground chicken meat	2	+	+	+(ox+)	+	+/(ox+)	-	+	+	+	+	+	+	+	PD	+	+	+	PD	
5184	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	0	
5185	Pork kidneys	2	-	+/-	-	-	-	-	-	+/- 1col	-	E.coli	-	-	-	NA	-	-	-	NA	
5186	Pork meat	2	-	+ni/-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA	
5187	Beef meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5188	Red meat without skin	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5189	Pork meat	2	-	+ni/	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA	
5190	VSM	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
5206	Pork minced meat	2	+	-	-	-	-	-	+	+	+	+	+	+	+	PD	+	+	+	PD	
5207	Chicken white meat	2	+	+	+/-	+	+	+	+(weak reaction)	+3col	+	+	+	+	+	PA	+	+	+	PA	
5208	Fresh porkmeat	2	+	+	+	+	+	+	-	-	-	-	-	-	-	ND	-	-	-	ND	
5209	Pork throat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5210	Chicken meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
5211	Pork meat	2	-	-	+(ox+)	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA	

MEAT PRODUCTS																					
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦					Reveal Salmonella Test									Enrichment storage during 72H-4°C			
				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
5212	Ground chicken meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
5213	Raw pork meat	2	+	+	+	+	+	+	-	-	-	-	-	-	-	-	ND	-	-	-	ND
5214	Pork meat and ribs	2	+	+	-	+	+/-	+	-	-	-	-	-	-	-	-	ND	-	-	-	ND
5215	Hen meat	2	+	-	-	-	-	+	+	+	+	+	+	+	+	+	PD	+	+	+	PD
5216	Pork meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
5217	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA
5218	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA
5219	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA
5220	Pork meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
5221	Pork meat	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA
5222	Pork meat	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
5223	Ground chicken meat	2	+	+	+/-	+/-1col	+	+	+(weak reaction)	+	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA
5224	VSM	2	+	+	+/-	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
5225	Pork kidneys	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA
5226	Pork	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA
5227	Chicken skin	2	+	+/-	+	+	+/-	+	-	-	-	-	-	-	-	-	ND	-	-	-	ND
5228	Turkey VSM	2	-	-	+/-	-	+	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA
5229	Ground pork meat	2	+	+/-	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
3604	Ready to eat food	1	+	+	+	+	+	+	+	+p	+	+	+p	+	+	+	PA	+	+	+	PA
3605	Bacon burger	1	+	+	+	+	+	+	+	+M	+	+	+p	+	+	+	PA	+	+	+	PA
3606	Ready to eat food	1	+	+	+	+	+	+	+	+p	+	+	+p	+	+	+	PA	+	+	+	PA
3624	Sausage	1	-	-	-	-	-	-	-	-	/	/	/	/	/	-	NA	/	-	-	NA
3625	Sausages	1	+	+	+	+	+	+	+(very weak reaction)	+ni/+	+	+	+ni/+	+	+	+	PA	+ weak reaction	+	+	PA
3626	Merguez	1	-	-	-	-	-	-	+(very weak reaction)	-	/	/	/	/	/	-(PPNC)	PPNA	+ weak reaction	-	-(PPNC)	PPNA
3627	Delicatessen	1	-	-	-	-	-	-	-	-	/	/	/	/	/	-	NA	/	-	-	NA
3677	Chitterlings	1	+	+	+	+	+	+	+(very weak reaction)	+ni/+	+	+	+m	+	+	+	PA	+ very weak reaction	+	+	PA
3678	Delicatessen	1	+	+	+	+	+	+	+	+p	+	+	+p	+	+	+	PA	+	+	+	PA

DAIRY PRODUCTS																					
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦					Reveal Salmonella Test								Enrichment storage during 72H-4°C				
				RVS broth		MKTTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
5538	Skimmed milk powder	4	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5539	Milk powder	4	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5540	Milk powder	4	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5541	Milk powder	4	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
5542	Milk powder	4	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
327	Vanilla ice cream(raw milk)	1	+	+	-	-	-	+	-	-	-	-	-	-	-	ND	-	+	-	ND	
328	Nougat ice cream(raw milk)	1	+	+	+	+	+	+	+(weak reaction)	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
329	Vanilla ice cream	1	+	+	+/-	+	+/-	+	+	+	+	-	-	-	+	PA	+	+	+	PA	
380	Tiramisu	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	0	
381	Raspberries tiramisu	1	+	-	-	-	-	-	-	+/-	+	+	+/-	+	+	+	(S.Agona)	+	+	+	PD
387	Frozen nougat	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
388	Frozen nougat	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
389	Cocoa ice cream	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
390	Vanilla ice cream	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
448	Tiramisu	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
449	Tiramisu	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
452	Vanilla ice cream	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
453	Coffe ice cream	1	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
542	Cheese pie	1	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
1626	Raw milk cheese	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
1627	Raw milk cheese	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
1628	Raw milk cheese	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
1629	Raw milk cheese	5	+	+	+	+	+	+	+(weak reaction)	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
1630	Raw milk cheese	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
1631	Raw milk cheese	5	+	+	+	+ni/-	+ni/-	+	+(weak reaction)	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
1884	Raw milk cheese	5	-	-	-	-	-	-	+(very weak reaction)	-	/	/	-	/	-	PPNA	+(very weak reaction)	-	-	PPNA	
1885	Raw milk cheese	5	+	+	+	+	+	+	+	+	+	+/-	+	-	+	PA	+	+	+	PA	
1886	Raw milk cheese	5	+	+	+	+	+	+	+(weak reaction)	+	+	+	+/-	+	+	PA	+(weak reaction)	+	+	PA	
1887	Raw milk cheese	5	+	-	-	-	+/-	+	-	-	/	/	/	/	-	ND	-	/	-	ND	
1888	Raw milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
1889	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
1890	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
1891	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	

♦ Analysis performed according to the COFRAC accreditation

DAIRY PRODUCTS																				
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦				Reveal Salmonella Test						Enrichment storage during 72H-4°C						
				RVS broth		MKTn broth		Result	Test result	Confirmation			Final result	Agreement	Test result	Confirmation	Final result	Agreement		
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			Typical colonies	Latex test	Reference tests							Typical colonies	Latex test
1892	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1893	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1894	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1895	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2030	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2031	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2032	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2033	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2034	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2035	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2036	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2037	Cream	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2038	Raw milk cheese	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2039	Raw milk cheese	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2040	Raw milk cheese	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2041	Raw milk cheese	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2089	Raw milk cheese	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2090	Raw milk cheese	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2134	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2135	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2136	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2137	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2138	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2139	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2140	Fermented milk	5	+	+	+	+	+/-	+	+ (weak reaction)	+	+	+	-	/	+	PA	+	+	+	PA
2141	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2142	Fermented milk	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2143	Raw milk cheese	5	+	+ 1 col	-	+	-	+	+ (very weak reaction)	+1col	+	+	-	/	+	PA	+weak reaction	+	+	PA
2144	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
2145	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
2146	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
2147	Fermented milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
2321	Raw milk	5	+	+	+	+m	+M	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2322	Raw milk	5	+	+/-	+	+m	+M	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2323	Raw milk	5	+	+/-	+	+m	+m	+	+ (very weak reaction)	+	+	+	+	+	+	PA	+weak reaction	+	+	PA
2324	Raw milk	5	+	+	+	+1col	+m	+	+ (very weak reaction)	+	+	+	+	+	+	PA	+weak reaction	+	+	PA
2325	Raw milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
2326	Raw milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
2327	Raw milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
2328	Raw milk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				NA
3607	Cappucino	1	+	-	-	-	-	-	+	+p	+	+	+p	+	+	PD	+	+	+	PD
3608	Pastry(Forêt noire)	1	+	+	+	+	+	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA

DAIRY PRODUCTS																					
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦				Reveal Salmonella Test								Enrichment storage during 72H-4°C					
				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
3609	Pastry(cerisier)	1	+	-	-	-	-	-	+	+p	+	+	+p	+	+	+	PD	+	+	+	PD
3663	Cappucino	1	+	+	+	+	+	+	+	+p	+	+	+p	+	+	+	PA	+	+	+	PA
3664	Pastry(Forêt noire)	1	+	+	+	+	+	+	+	+p	+	+	+p	+	+	+	PA	+	+	+	PA
3665	Pastry	1	+	-	-	-	-	-	+	+p	+	+	+p	+	+	+	PD	+	+	+	PD

EGG PRODUCTS																					
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦					Reveal Salmonella Test								Enrichment storage during 72H-4°C				
				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
1632	Baked custard	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1633	Pastry	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1634	Pastry(lemon pie)	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1635	Quiche(onions and bacon)	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1636	Quiche Lorraine	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1637	Chee pie	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1638	Mayonnaise	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1639	Mayonnaise	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1640	Mayonnaise	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
1641	Whole egg product	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
1642	Whole egg product	5	+	+	+	+ni/+	+	+	+ (weak reaction)	+	+	+	+	+	+	+	PA	+very weak reaction	+	+	PA
1643	Raw egg yolk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
1644	Egg yolk	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
1645	Whole egg product	5	+	+	+	-	+	+	+ (weak reaction)	+	+	+	+	+	+	+	PA	+	+	+	PA
1646	Whole egg product	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA				
1647	Whole egg product	5	-	+ni/-	-	-	-	-	-	+ni/-	/	/	-	/	-	-	NA				
1648	Mayonnaise	5	-	+ni/-	-	-	-	-	-	+ni/-	/	/	-	/	-	-	NA				
1649	Mayonnaise	5	-	-	-	+ni/+ (Citrobacter youngae)	-	-	-	-	/	/	-	/	-	-	NA				
2018	Quiche (Onions and bacon)	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2019	Quiche Lorraine	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2020	Dessert(Clafoutis)	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2021	Pastry	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2022	Pastry	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2023	Ile flottante	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2024	English cream	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2025	Quiche(Brocolis salmon)	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2026	Whole egg powder	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2027	White egg powder	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2028	Dehydrated preparation for english cream	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2029	Dehydrated preparation for custard	5	-	-	-	-	-	-	-	-	/	/	-	/	-	-	NA				
2067	Ready to eat food	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA

♦ Analysis performed according to the COFRAC accreditation

EGG PRODUCTS																				
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦					Reveal Salmonella Test								Enrichment storage during 72H-4°C			
				RVS broth		MKTn broth		Result	Test result	Confirmation				Final result	Agreement	Test result	Confirmation	Final result	Agreement	
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD		Brilliance salmonella								
2068	Pie with vegetables	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2069	Pie with cheese	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2070	Egg based cream	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2071	Baked custard	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2072	Dessert(Clafoutis)	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2073	Pastry	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2074	Cream with caramel	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2075	Dehydrated preparation for cream	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2076	Dehydrated preparation for baked custard	5	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
2077	Links pie	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2078	Spinash and goat cheese pie	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2079	Ready to eat food	5	+	+	-	-	-	+	-	+7col	+	+	-	/	-	ND	-	/	-	ND
2080	Rize cake	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2081	Semolina cake	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2082	Pastry	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2083	Vanilla cream	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2084	Lemon snow pie	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2085	Dehydrated preparation for vanilla cream	5	-	-	+/- (Acinetobacter)	-	-	-	-	-	/	/	-	/	-	NA	-	-	-	NA
2086	Egg yolk product	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2087	Whole egg product	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2088	White egg product	5	-	-	-	-	-	-	-	-	/	/	-	/	-	NA				
2279	White egg powder	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2280	White egg powder	5	-	-st	-st	-st	-st	-	-	-st	/	/	-st	/	-	NA				
2281	Whole egg powder	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2282	Whole egg powder	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2283	White egg powder	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2284	Whole egg powder	5	-	-st	-st	-st	-st	-	-	-st	/	/	-st	/	-	NA				
2285	Pasteurised white egg product	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2286	Pasteurised white egg product	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2287	Pasteurised white egg product	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2288	Pasteurised whole egg product	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2289	Pasteurised whole egg product	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2290	White egg product	5	+	+p	+p	+p	+p	+	+	+p	+	+	+p	+	+	PA	+	+	+	PA
2291	White egg powder	5	-	-st	-st	-st	-st	-	-	-st	/	/	-st	/	-	NA				
2292	Whole egg powder	5	-	-st	-st	-st	-st	-	-	-st	/	/	-st	/	-	NA				

SEAFOOD AND VEGETABLES																					
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦					Reveal Salmonella Test								Enrichment storage during 72H-4°C				
				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD		Brilliance salmonella		Typical colonies	Latex test						
3825	Scallops terrine	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
3826	Shell fish salad	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
3828	Vegetables for couscous preparation	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
3830	Surimi/smoked salmon mix	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4256	Fish	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4257	Tuna	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4258	Salmon	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4259	Seafood	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4403	Ready to eat food with vegetables	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4405	Fish fillet	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4406	Fish fillet	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4407	Salmon	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4408	Fish fillet	2	+	+	+	+	+	+	-	-	-	-	-	-	-	ND	-	-	-	ND	
4650	Frozen peas	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4651	Frozen broccoli	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4652	Frozen Brussels sprouts	1	+	+ni/+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4653	Frozen spinach	1	+	+ni/+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4654	Frozen vegetables mix for ratatouille	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4664	White cabbage	1	-	-	-	-	-	-	+	+	+	-	-	-	-	-(PPNC)	PPNA	-	-	-	NA
4665	Deli-salad with cucumber	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4666	Deli-salad with carrots	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4667	Deli-salad with celery	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4668	Deli-salad with mayonnaise	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4680	Deli-salad with coleslaw	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4681	Deli-salad with red cabbage	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA				
4682	Cucumber-salmon mix	2	+	+	+	-	-	+	-	-	-	-	-	-	-	ND	-	-	-	ND	
4683	Tomatoes-tuna mix	2	-	-	-	-	-	-	-	-	-	-	-	-	-	NA					
4687	Tuna with tomatoes	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
35	Tarama	1	+	-	-	-	-	-	+	+	+	+	+	+	+	+	PD	+	+	+	PD

♦ Analysis performed according to the COFRAC accreditation

SEAFOOD AND VEGETABLES																						
Sample n°	Product	Protocol (according to the technical proposal)	Global result	ISO 6579 method♦					Reveal Salmonella Test								Enrichment storage during 72H-4°C					
				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement	
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella									
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests							
36	Tuna rillettes	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
37	Surimi	1	+	+ni+	-	-	+ni+	+	-	-	-	-	-	-	-	-	ND	-	-	-	ND	
38	Cooked coley	1	-	-	+	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
39	Minced fish	1	+	+	+	+	+	+	-	-	-	-	-	-	-	-	ND	-	-	-	ND	
40	Minced salmon	1	+	+	+	+	+	+	+(weak reaction)	+	+	+	+	+	+	+	PA	+	+	+	PA	
89	Shrimps	1	+	+	+	+	+	+	-	+	+	+	+	+	+	+	PA	+(very weak reaction)	+	+	PA	
90	Crayfishes tails	1	+	+	+	+	+	+	-	+	+	+	+	+	+	+	PA	+(weak reaction)	+	+	PA	
91	Crab rillettes	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
92	Salmon terrine	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
93	Scallops terrine	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
94	Cooked salmon	1	+	+	+	+	+	+	+(very weak reaction)	+1col	+	+	+1col	+	+	+	PA	+(very weak reaction)	+	+	PA	
337	White raw fish	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
368	Marrow	2	-	-	+(Ox+)	-	+(Ox+)	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA	
369	Endive	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
370	Carrots	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
371	White mushrooms	2	-	+/- (E.cloacae)	+(Ox+)	-	+1col(ox+)	-	-	-	-	-	-	-	-	-	NA	+(weak reaction)	-	-	-(PPNC)	PPNA
382	Fish parmentier	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
383	Tuna salad	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
384	Smoked trout	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
385	Smoked salmon	1	-	-	+/- (Morganella morganii)	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	NA	
386	Smoked herring fillets	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
456	Brocoli	2	-	-	-	-	-	-	+(weak reaction)	-	-	-	-	-	-	-	-(PPNC)	PPNA	-	-	-	NA
457	Mushrooms	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
458	Salad	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
460	Mix salad	1	+	+	+	+	+	+	(Salmonella non agglutinable)	-	-	-	-	-	-	-	ND	-	-	-	ND	
461	Cooked tomatoes	1	+	+	+	+	+	+	+(weak reaction)	+	+	+	+	+	+	+	PA	+(very weak reaction)	+	+	+	PA
538	Marinated vegetables	1	+	+ni/+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
539	Marinated mackuerel	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
540	Marinated salmon	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA	
541	Brocolis and salmon pie	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
543	Smoked herring fillets	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
544	Cod fillets	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	
545	Piece of cod	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-	

SEAFOOD AND VEGETABLES																					
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				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
546	Red salad	1	-	-	-	-	-	-	-	-						-	NA				
547	Courgette	1	-	-	-	-	-	-	-	-						-	NA				
2785	Cacao	4	-	-	-	-st	-st	-	-	-st	/	/	-st	/		-	NA				
2786	Cacao	4	+	-st	-st	-st	-st	-	+very weak reaction	+p	+	+	+p	+		+	PD	+very weak reaction	+	+	PD
2787	Chocolate based dehydrated beverage	4	-	-st	-st	-st	-st	-	-	-st	/	/	-st	/		-	NA				
2788	Cereals for babies	4	+	-st	-st	-st	-st	-	+	+p	+	+	+p	+		+	PD	+	+	+	PD
2789	Cereals for babies	4	+	-st	-st	-st	-st	-	+very weak reaction	+p	+	+	+p	+		+	PD	+very weak reaction	+	+	PD
2790	Wheat flour	4	+	+p	+p	+p	+p	+	+very weak reaction	+2col	+	+	+5col	+		+	PA	+very weak reaction	+	+	PA
3610	Ready to eat food	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3611	Salmon with links(ready to eat food)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3612	Paella	1	+	+	+	+	+	+	+	+M	+	+	+p	+		+	PA	+	+	+	PA
3613	Salmon with links(ready to eat food)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3614	Salmon and brocolis pie	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3615	Salmon terrine	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3616	Ready to eat salad (Piémontaise)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3617	Pasta with cheese and ham	1	+	+	+	+	+	+	+very weak reaction	+m	+	+	+m	+		+	PA	+ weak reaction	+	+	PA
3618	Sandwich(ham, egg, tomato, salad)	1	+	+	+	+	+	+	+very weak reaction	+ni/+	+	+	+ni/+	+		+	PA	+ weak reaction	+	+	PA
3619	Sandwich (ham, egg, tomato)	1	+	+	+	+	+	+	+very weak reaction	+ni/+	+	+	+ni/+	+		+	PA	+ very weak reaction	+	+	PA
3620	Ready to eat salad(Piémontaise)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3621	Vegetables mix	1	+	-	-	-	-	-	+	+M	+	+	+p	+		+	PD	+	+	+	PD
3622	Pasta with surimi	1	+	+	+	+	+	+	+	+M	+	+	+p	+		+	PA	+	+	+	PA
3623	Sandwich	1	+	-	-	-	-	-	+weak reaction	+ni/+	+	+	+ni/+	+		+	PD	+ weak reaction	+	+	PD
3659	Ready to eat meal(pork with vegetables)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3660	Ready to eat meal(gratin Dauphinois))	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3661	Ready to eat meal(Duck parmentier)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3662	Moussaka with poultry	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA

SEAFOOD AND VEGETABLES																					
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				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
										Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests						
3666	Ready to eat meal(pork)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3667	Ready to eat meal(gratin Dauphinois))	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3668	Ready to eat meal(duck)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3669	Moussaka	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3670	Salmon terrine	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3671	Prawns terrine	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3672	Scallops terrine	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3673	Ready to eat meal(pork and rice)	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3674	Prawn crackers	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3675	Pork samoussa	1	+	+	+	+	+	+	+	+p	+	+	+p	+		+	PA	+	+	+	PA
3676	Cod fritters	1	+	+	+	-	+	+	+ very weak reaction	+ni/+	+	+	+p	+		+	PA	+ very weak reaction	+	+	PA
3679	Smoked salmon	1	+	+	+	+	+	+	+ very weak reaction	+ni/+	+	+	+m	+		+	PA	+ very weak reaction	+	+	PA
3680	Smoked trout	1	+	-	-	+	+	+	+ very weak reaction	+ni/+	+	+	+m	+		+	PA	+ very weak reaction	+	+	PA

FEEDSTUFFS																					
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				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD			Brilliance salmonella								
Typical colonies	Latex test	Reference tests	Typical colonies	Latex test	Reference tests	Final result	Agreement	Test result	Confirmation	Final result	Agreement										
3704	Pet food (dry food)	3	-	-	-	-	-	-	+/- (very weak reaction)	-						-(PPNC)	PPNA				
3705	Poultry powder	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
3706	Feed for hens	3	-	-	-	-	-	-	-	-						-	NA				
3707	Feed for hens	3	-	-	-	-	-	-	-	-						-	NA				
4260	Poultry dehydrated powder	3	-	-	-	-	-	-	+(very weak reaction)	-						-(PPNC)	PPNA				
4261	Feeding stuff	3	-	-	-	-	-	-	-	-						-	NA				
4262	Pork meat	3	-	-	-	-	-	-	-	-						-	NA				
4263	Poultry powder	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PD	+	+	+	PD
4385	Pet fod	3	-	-	-	-	-	-	-	-						-	NA				
4386	Pet food	3	-	-	-	-	-	-	-	-						-	NA				
4387	Poultry dehydrated powder	3	-	-	-	-	-	-	-	-						-	NA				
4388	Poultry dehydrated powder	3	-	-	-	-	-	-	-	-						-	NA				
4389	Poultry dehydrated powder	3	-	-	-	-	-	-	-	-						-	NA				
4390	Pet food	3	-	-	-	-	-	-	-	-						-	NA				
4391	Flour	3	-	-	-	-	-	-	-	-						-	NA				
4692	Pet food	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4693	Pet food	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
4696	Pet food	3	-	-	-	-	-	-	-	-						-	NA				
4698	Dehydrated poultry proteins	3	+	+	+	+	+	+	-	-						-	ND	-	-	-	ND
41	Dog pâté	1	+	+	+	+	+	+	-	+1col	+	+	+	+	+	-	ND	-	+	-	ND
42	Dog sausage	1	+	+	+	+	+	+	+(very weak reaction)	+	+	+	+	+	+	+	PA	+(very weak reaction)	+	+	PA
43	Beef terrine for dog	1	+	+	+	+	+	+	+(very weak reaction)	+	+	+	+	+	+	+	PA	+(very weak reaction)	+	+	PA
44	Salmon terrine for dog	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
45	Fish terrine for cats	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
46	Rabbit terrine for cats	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
71	Lamb terrine for dog	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
72	Duck terrine for dog	1	-	-	-	-	-	-	-	-						-	NA				
73	Feed stuff balls	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
74	Feed stuff balls	1	-	-	-	-	-	-	-	-						-	NA				
75	Feed stuff balls	1	-	-	-	-	-	-	-	-						-	NA				

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				RVS broth		MKTn broth		Result	Test result	Confirmation						Final result	Agreement	Test result	Confirmation	Final result	Agreement
				XLD	Chromagar salmonella	XLD	Chromagar salmonella			XLD		Brilliance salmonella		Reference tests	Reference tests						
76	Feed stuff balls	1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
184	Pellets for dog	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
185	Pellets	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
186	Pellets for dog	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
187	Pellets	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
188	Pellets	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
189	Pellets	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
190	Dehydrated poultry proteins	3	-	-	-	-	-	-	+(very weak reaction)	-	-	-	-	-	-	-(PPNC)	PPNA	-	-	-	NA
314	Raw beef meat for animals	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
315	Raw beef meat for animals	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
316	Raw beef meat for animals	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
459	Beef meat for animals	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
464	Pellets for cats	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
465	Pellets for dogs	3	-	-	-	-	-	-	-	+ 3col	+	+	+1col	+	-	-	NA	-	-	-	NA
466	Pellets for cats	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
467	Dog pâté	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
468	Balls for cats	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
469	Balls for dog	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	-	-	-	-
531	Wheat flour for cows	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
532	Flour for pigs	3	+	+	+	+	+	+	+	-	-	-	-	-	-	+	PA	+	+	+	PA
533	Granular for pigs	3	+	-	-	-	-	-	+	+	+	+	+	+	+	+	PD	+	+	+	PD
534	Feed for veals	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
535	Bovine meat for animals	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
536	Bovine meat for animals	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
537	Bone for animals	2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
586	Cattle feed	3	+	+	+	+	+	+	+(weak reaction)	-	-	-	+	+	+	+	PA	+	+	+	PA
587	Feed for cow	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
588	Granular for pigs	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
589	Feed for cow	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
590	Pounded wheat	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
591	Barley for cattle	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
592	Flour for pigs	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA
593	Whey flour for cows	3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	PA	+	+	+	PA

Appendix 4 – Inclusivity and exclusivity: raw data

INCLUSIVITY STRAINS										
Strain	Species	Reference	Origin	Enrichment conditions	Inoculation level(cfu/200ml enrichment broth)	Reveal Salmonella Test			Reference method	
						Reveal Test result	XLD	Latex test		
1	<i>Salmonella</i>	Abony (A)	CIP 8039		REVIVE	3	+(weak reaction)	+	+	
2	<i>Salmonella</i>	Agona (B)	A00V38	Feedstuff	REVIVE	1	+	+	+	
3	<i>Salmonella</i>	Anatum (E1)	6140	Reay to eat food (Bœuf Bourguignon)	REVIVE	3	-	-	/	
					REVIVE + 25ml Milk	2	+(weak reaction)	+	+	
4	<i>Salmonella</i>	Bardo		Sausage meat	REVIVE	7	+	+	+	
5	<i>Salmonella</i>	Berta (D1)	CIP 10682		REVIVE	2	+	pink colonies	+	
6	<i>Salmonella</i>	Blockley (C2/C3)	Ad 923	Chicken	REVIVE	9	+(weak reaction)	+	+	
7	<i>Salmonella</i>	Bovismorbificans (C2/C3)	728	Agar	REVIVE	8	+(weak reaction)	+	+	
8	<i>Salmonella</i>	Braenderup (C1)	178	Sausages	REVIVE	9	+	+	+	
9	<i>Salmonella</i>	Brandenburg (B)	Ad 351	Seafood	REVIVE	3	+	+	+	
10	<i>Salmonella</i>	Bredeney (B)	396	Ground beef	REVIVE	0	+	+	+	
11	<i>Salmonella</i>	Cremieu (C2/C3)	230	Hare	REVIVE	0	+(weak reaction)	+	+	
12	<i>Salmonella</i>	Derby (B)	Ad 1093	Frozen fish fillet	REVIVE	5	+	+	+	
13	<i>Salmonella</i>	Dublin (D1)	Ad 528	Pancake	REVIVE	0	+	+	+	
14	<i>Salmonella</i>	Duisburg (B)	42	Poultry	REVIVE	3	+	+	+	
15	<i>Salmonella</i>	Enteritidis (D1)	Ad 926	Raw veal meat	REVIVE	1	+	+	+	

INCLUSIVITY STRAINS

Strain	Species	Reference	Origin	Enrichment conditions	Inoculation level(cfu/200ml enrichment broth)	Reveal Salmonella Test			Reference method	
						Reveal Test result	XLD	Latex test		
16	<i>Salmonella</i>	Essen (B)	38	Poultry	REVIVE	4	-	-	/	
					REVIVE + 25ml Milk	10	+	+	+	
17	<i>Samonella</i>	Falkensee (E1)	693	Sausage meat	REVIVE	4	+	+	+	
18	<i>Salmonella</i>	Gallinarum biovar pullorum (D1)	Ad 300	Poultry slaughterhouse	REVIVE	2	-	-	/	
					REVIVE + 25ml Milk	4	-(very weak reaction in BHI)	pink colonies	+weak reaction	atypical microcolonies
					REVIVE + 25ml Milk	23	-			
19	<i>Salmonella</i>	Gallinarum (D1)	1	Poultry environnemental sample	REVIVE	9	+very weak reaction	pink colonies	+	pink colonies on XLD
20	<i>Salmonella</i>	Gallinarum (D1)	2	Poultry environnemental sample	REVIVE	7	+very weak reaction	small colonies with black center	+	small black center colonies on XLD
21	<i>Salmonella</i>	Give (E1)	438	Ground beef	REVIVE	7	+	+	+	
22	<i>Salmonella</i>	Hadar (C2/C3)	35	Poultry	REVIVE	11	+(weak reaction)	+	+	
23	<i>Salmonella</i>	Heidelberg (B)	A00E005	Dairy industry environnemental sample	REVIVE	6	+	+	+	
24	<i>Salmonella</i>	Indiana (B)	2	Fish flour	REVIVE	4	-	-	/	
					REVIVE + 25ml Milk	8	+	+	+	
25	<i>Salmonella</i>	Infantis (C1)	12	Ready to eat food	REVIVE	6	+	+	+	
26	<i>Salmonella</i>	Kentucky (C2/C3)	CIP 105623		REVIVE	1	-	+	+	
					REVIVE + 25ml Milk	10	+	+	+	

INCLUSIVITY STRAINS										
Strain	Species	Reference	Origin	Enrichment conditions	Inoculation level(cfu/200ml enrichment broth)	Reveal Salmonella Test			Reference method	
						Reveal Test result	XLD	Latex test		
27	<i>Salmonella</i>	Kottbus (C2/C3)	1	Environmental sample (Slaughterhouse)	REVIVE	4	+	+	+	
28	<i>Salmonella</i>	Lille (C1)	37	Poultry	REVIVE	10	+(weak reaction)	+	+	
29	<i>Salmonella</i>	Livingstone (C1)	E1	Egg white powder	REVIVE	7	+	+	+	
30	<i>Salmonella</i>	London (E1)	326	Ham	REVIVE	14	+	+	+	
31	<i>Salmonella</i>	Manhattan (C2/C3)	900	Dairy environmental sample	REVIVE	3	+(weak reaction)	+	+	
32	<i>Salmonella</i>	Mbandaka (C1)	Ad 914	Mayonnaise	REVIVE	6	+	+	+	
33	<i>Salmonella</i>	Meleagridis (E1)	505	Raw milk	REVIVE	3	+	+	+	
34	<i>Salmonella</i>	Montevideo (C1)	Ad 912	Raw milk	REVIVE	25	+	+	+	
35	<i>Salmonella</i>	Murenster (E1)	CIP 107859		REVIVE	3	-	-	/	
					REVIVE + 25ml Milk	10	+	+	+	
36	<i>Salmonella</i>	Napoli (D1)	Ad 928	Bovine	REVIVE	7	+	+	+	
37	<i>Salmonella</i>	Newport (C2/C3)	540	Toulouse sausage	REVIVE	9	+(weak reaction)	+	+	
38	<i>Salmonella</i>	Norwich (C1)	Ad 1172	Dairy product	REVIVE	3	+	+	+	
39	<i>Salmonella</i>	Panama (D1)	195	Ground beef	REVIVE	2	+	+	+	
40	<i>Salmonella</i>	Paratyphi A (A)	ATCC 9150	/	REVIVE	0	-	+	+	
					REVIVE + 25ml Milk	4	-(+ very weak reaction in BHI)	+	+	+
						20	-	+	+	+
41	<i>Salmonella</i>	Paratyphi A (A)	ATCC 11511	/	REVIVE + 25ml Milk	15	-	+	+	+

INCLUSIVITY STRAINS										
Strain	Species	Reference	Origin	Enrichment conditions	Inoculation level(cfu/200ml enrichment broth)	Reveal Salmonella Test			Reference method	
						Reveal Test result	XLD	Latex test		
42	<i>Salmonella</i>	Paratyphi A (A)	CIP 5541	/	REVIVE + 25ml Milk	10	-	+	+	+
41	<i>Salmonella</i>	Paratyphi B (B)	Ad 301	Clinical	REVIVE	2	-	+	+	+
					REVIVE + 25ml Milk	3	-(+ very weak reaction in BHI)	-	/	
					REVIVE + 25ml Milk	20	+	+	+	+
42	<i>Salmonella</i>	Paratyphi B (B)	Ad1439	White chicken meat	REVIVE + 25ml Milk	26	+	+	+	+
43	<i>Salmonella</i>	Paratyphi C (C1)	ATCC 13428	/	REVIVE	0	+(weak reaction)	+	+	
44	<i>Salmonella</i>	Regent (E)	328	Duck	REVIVE	13	+	+	+	
45	<i>Salmonella</i>	Rissen (C)	39	Poultry	REVIVE	2	-	-	/	+
					REVIVE + 25ml Milk	4	+(weak reaction)	+	+	
46	<i>Salmonella</i>	Saintpaul (B)	F31	Pilchard fillet	REVIVE	3	+	+	+	
47	<i>Salmonella</i>	Senftenberg (E4)	Ad 355	Seafood	REVIVE	5	+	+	+	
48	<i>Salmonella</i>	Tennessee (C1)	A00E006	Dairy industry environmental sample	REVIVE	14	+(weak reaction)	+	+	
49	<i>Salmonella</i>	Thompson (C1)	AER301	Poultry	REVIVE	9	+	+	+	
50	<i>Salmonella</i>	Typhi (D1)	Ad 302	Clinical	REVIVE	1	+	+	+	
51	<i>Salmonella</i>	Typhimurium (B)	305	Paella	REVIVE	5	+	+	+	
52	<i>Salmonella</i>	Typhimurium SI 1,4,[5],12:-:- (variant immobile)	Ad1333	Tiramisu	REVIVE	5	+	+	+	+

INCLUSIVITY STRAINS

Strain	Species	Reference	Origin	Enrichment conditions	Inoculation level(cfu/200ml enrichment broth)	Reveal Salmonella Test			Reference method	
						Reveal Test result	XLD	Latex test		
53	<i>Salmonella</i>	Typhimurium SI 1,4,[5],12:i:- (variant monophasique)	Ad1334	Ready to eat food	REVIVE	8	+	+	+	+
54	<i>Salmonella</i>	Typhimurium SI 1,4,[5],12:-:1,2 (variant monophasique)	Ad1335	Hen	REVIVE	7	+	+	+	+
55	<i>Salmonella</i>	Virchow (C1)	F276	Curry	REVIVE	11	+	+	+	
56	<i>Salmonella</i>	Wien (B)	CIP 8122		REVIVE	2	+	+	+	

EXCLUSIVITY STRAINS					
	Strain	Reference	Origin	Inoculation level cfu/ml BPW	Reveal Salmonella test result
1.	<i>Citrobacter braakii</i>	Ad833	Raw beef meat	4,5.10 ⁵	-
2.	<i>Citrobacter Diversus</i>	adria 140	Raw milk	4,2.10 ⁵	-
3.	<i>Citrobacter freundii</i>	adria 23	Raw pork sausage	4,1.10 ⁵	-
4.	<i>Citrobacter freundii</i>	adria 175	Raw duck meat	5,0.10 ⁵	-
5.	<i>Citrobacter koseri</i>	adria 71	Frozen vegetables	5,5.10 ⁵	-
6.	<i>Enterobacter agglomerans</i>	adria 11	Cheese	2,4.10 ⁵	-
7.	<i>Enterobacter amnigenus</i>	A00C068	Raw poultry meat	3,4.10 ⁵	-
8.	<i>Enterobacter cloacae</i>	adria 10	Raw milk	1,8.10 ⁵	-
9.	<i>Enterobacter intermedius</i>	adria 60	Bean	9,8.10 ⁴	-
10.	<i>Enterobacter kobei</i>	Ad 342	Ham	3,8.10 ⁵	-
11.	<i>Enterobacter sakazakii</i>	adria 95	Fermented milk	4,7.10 ⁵	-
12.	<i>Erwinia carotovora</i>	CIP 8283	Potatoes	6,0.10 ³	-
13.	<i>Escherichia coli</i>	adria 19	Grated carrots	2,9.10 ⁵	-
14.	<i>Escherichia hermanii</i>	Ad 461	Dessert	2,3.10 ⁵	-
15.	<i>Escherichia vulneris</i>	adria 127	Raw milk	5,5.10 ⁵	-
16.	<i>Hafnia alvei</i>	adria 167	Raw pork sausage	4,6.10 ⁵	-
17.	<i>Klebsiella oxytoca</i>	57	Food product	3,2.10 ⁵	-
18.	<i>Klebsiella pneumoniae</i>	47	Raw turkey meat	4,4.10 ⁵	-
19.	<i>Kluyvera spp</i>	adria 41	Raw milk	2,2.10 ⁵	-
20.	<i>Morganella morganii</i>	CIP A236	/	3,5.10 ⁵	-
21.	<i>Pantoea agglomerans</i>	adria 86	Frozen vegetables	4,5.10 ⁵	-
22.	<i>Proteus mirabilis</i>	Ad639	Mayonnaise	4,8.10 ⁵	-
23.	<i>Proteus vulgaris</i>	adria 43	Sliced ham	5,0.10 ⁴	-

EXCLUSIVITY STRAINS					
	Strain	Reference	Origin	Inoculation level cfu/ml BPW	Reveal Salmonella test result
24.	<i>Providencia rettgeri</i>	adria 112	White liquid egg	2,2.105	-
25.	<i>Rhanella aquatilis</i>	adria 69	Molluscs	3,6.104	-
26.	<i>Serratia liquefaciens</i>	26	Egg product	1,2.105	-
27.	<i>Serratia proteomaculans</i>	A00C056	Ham	9,4.104	-
28.	<i>Shigella flexneri</i>	CIP 8248	/	2,0.105	-
29.	<i>Shigella sonnei</i>	CIP 8249T (ATCC 29930)	/	1,7.105	-
30.	<i>Yersinia enterocolitica</i>	adria 32	Bacon	1,5.105	-

Appendix 5 – Inclusivity: additional tests performed on *Salmonella* Paratyphi A strains

Strain	<i>Salmonella</i> Reveal test on BHI overnight culture	Inoculation level (cfu/225ml Revive + milk))	Reveal <i>Salmonella</i> method					Reference method result				
			<i>Salmonella</i> Reveal test	XLD	Latex	Brilliance	Latex	ufc/225ml BPW (Reference method)	RVS/ XLD	RVS/ Chromagar Salmonella	MKTTn/ XLD	MKTTn/ Chromagar Salmonella
<i>Salmonella</i> Paratyphi A ATCC 11511	+ (weak reaction)	11	-	+(H2S-)	+ (weak reaction)	-	/	9	+(H2S-)	+	+(H2S-)	+
<i>Salmonella</i> Paratyphi A ATCC 9281	+ (weak reaction)	15	-	+(H2S-)	+	+	+ (weak reaction)	12	+(H2S-)	+	+(H2S-)	+
<i>Salmonella</i> Paratyphi A ATCC 12176	+ (weak reaction)	9	-	+(H2S-)	+	+	+	11	+(H2S-)	+	+(H2S-)	+
<i>Salmonella</i> Paratyphi A ATCC 81847	+ (weak reaction)	19	-	+(H2S-)	+	-	/	15	+(H2S-)	+	+(H2S-)	+

Appendix 6 – Accordance

Reference method

Level L0							
Laboratory	Positive results number obtained	Positive results probability	Positive pairs probability	Negative results number obtained	Negative results probability	Positive pairs probability	Identical results pairs probability
A	1	0,125	0,015625	7	0,875	0,765625	0,78125
C	0	0	0	8	1	1	1
E	0	0	0	8	1	1	1
F	0	0	0	8	1	1	1
G	0	0	0	8	1	1	1
H	0	0	0	8	1	1	1
I	0	0	0	8	1	1	1
J	0	0	0	8	1	1	1
K	0	0	0	8	1	1	1
L	0	0	0	8	1	1	1
M	0	0	0	8	1	1	1
N	0	0	0	8	1	1	1
O	0	0	0	8	1	1	1
Mean							0,983173077
Accordance							98,3%

Level L1							
Laboratory	Positive results number obtained	Positive results probability	Positive pairs probability	Negative results number obtained	Negative results probability	Positive pairs probability	Identical results pairs probability
A	5	0,625	0,390625	3	0,375	0,140625	0,53125
C	8	1	1	0	0	0	1
E	8	1	1	0	0	0	1
F	6	0,75	0,5625	2	0,25	0,0625	0,625
G	7	0,875	0,765625	1	0,125	0,015625	0,78125
H	7	0,875	0,765625	1	0,125	0,015625	0,78125
I	8	1	1	0	0	0	1
J	7	0,875	0,765625	1	0,125	0,015625	0,78125
K	8	1	1	0	0	0	1
L	8	1	1	0	0	0	1
M	7	0,875	0,765625	1	0,125	0,015625	0,78125
N	8	1	1	0	0	0	1
O	8	1	1	0	0	0	1
Mean							0,867788462
Accordance							86,8%

Level L2							
Laboratory	Positive results number obtained	Positive results probability	Positive pairs probability	Negative results number obtained	Negative results probability	Positive pairs probability	Identical results pairs probability
A	8	1	1	0	0	0	1
B	8	1	1	0	0	0	1
C	8	1	1	0	0	0	1
D	8	1	1	0	0	0	1
E	8	1	1	0	0	0	1
F	8	1	1	0	0	0	1
G	8	1	1	0	0	0	1
H	8	1	1	0	0	0	1
J	8	1	1	0	0	0	1
K	8	1	1	0	0	0	1
M	8	1	1	0	0	0	1
N	8	1	1	0	0	0	1
O	8	1	1	0	0	0	1
Mean							1
Accordance							100,0%

Alternative method

Level L0							
Laboratory	Positive results number obtained	Positive results probability	Positive pairs probability	Negative results number obtained	Negative results probability	Positive pairs probability	Identical results pairs probability
A	0	0	0	8	1	1	1
C	0	0	0	8	1	1	1
E	0	0	0	8	1	1	1
F	0	0	0	8	1	1	1
G	0	0	0	8	1	1	1
H	0	0	0	8	1	1	1
I	0	0	0	8	1	1	1
J	1	0,125	0,015625	7	0,875	0,765625	0,78125
K	0	0	0	8	1	1	1
L	0	0	0	8	1	1	1
M	0	0	0	8	1	1	1
N	0	0	0	8	1	1	1
O	0	0	0	8	1	1	1
Mean							0,983173077
Accordance							98%

Level L1							
Laboratory	Positive results number obtained	Positive results probability	Positive pairs probability	Negative results number obtained	Negative results probability	Positive pairs probability	Identical results pairs probability
A	7	0,875	0,765625	1	0,125	0,015625	0,78125
C	8	1	1	0	0	0	1
E	8	1	1	0	0	0	1
F	7	0,875	0,765625	1	0,125	0,015625	0,78125
G	6	0,75	0,5625	2	0,25	0,0625	0,625
H	6	0,75	0,5625	2	0,25	0,0625	0,625
I	8	1	1	0	0	0	1
J	8	1	1	0	0	0	1
K	8	1	1	0	0	0	1
L	7	0,875	0,765625	1	0,125	0,015625	0,78125
M	8	1	1	0	0	0	1
N	8	1	1	0	0	0	1
O	8	1	1	0	0	0	1
Mean							0,891826923
Accordance							89%

Level L2							
Laboratory	Positive results number obtained	Positive results probability	Positive pairs probability	Negative results number obtained	Negative results probability	Positive pairs probability	Identical results pairs probability
A	8	1	1	0	0	0	1
B	8	1	1	0	0	0	1
C	8	1	1	0	0	0	1
D	8	1	1	0	0	0	1
E	8	1	1	0	0	0	1
F	8	1	1	0	0	0	1
G	8	1	1	0	0	0	1
H	8	1	1	0	0	0	1
J	8	1	1	0	0	0	1
K	8	1	1	0	0	0	1
M	8	1	1	0	0	0	1
N	8	1	1	0	0	0	1
O	8	1	1	0	0	0	1
Mean							1
Accordance							100%

Appendix 7 – Concordance

Reference method

Level L0

Laboratories number 13
 Number of negative results per laboratory: 8

Laboratory	Number of negative results	Interlaboratories pairs with the same result	Total interlaboratories pairs number
A	7	672	768
C	8	760	768
E	8	760	768
F	8	760	768
G	8	760	768
H	8	760	768
I	8	760	768
J	8	760	768
K	8	760	768
L	8	760	768
M	8	760	768
N	8	760	768
O	8	760	768
Total		9 792	9 984
Concordance		98,1%	

Total + 1
 Total - 103

Level L1

Laboratories number 13
 Number of positive results per laboratory: 8

Laboratory	Number of positive results	Interlaboratories pairs with the same result	Total interlaboratories pairs number
A	5	468	768
C	8	696	768
E	8	696	768
F	6	548	768
G	7	624	768
H	7	624	768
I	8	696	768
J	7	624	768
K	8	696	768
L	8	696	768
M	7	624	768
N	8	696	768
O	8	696	768
Total		8 384	9 984
Concordance		84,0%	

Total + 95
 Total - 9

Level L2

Laboratories number 13
 Number of positive results per laboratory: 8

Laboratory	Number of positive results	Interlaboratories pairs with the same result	Total interlaboratories pairs number
A	8	768	768
C	8	768	768
E	8	768	768
F	8	768	768
G	8	768	768
H	8	768	768
I	8	768	768
J	8	768	768
K	8	768	768
L	8	768	768
M	8	768	768
N	8	768	768
O	8	768	768
Total		9 984	9 984
Concordance		100,0%	

Total + 104
 Total - 0

Alternative method

Level L0

Laboratories number 13
 Number of negative results per laboratory: 8

Laboratory	Number of negative results	Interlaboratories pairs with the same result	Total interlaboratories pairs number
A	8	760	768
C	8	760	768
E	8	760	768
F	8	760	768
G	8	760	768
H	8	760	768
I	8	760	768
J	7	672	768
K	8	760	768
L	8	760	768
M	8	760	768
N	8	760	768
O	8	760	768
Total		9 792	9 984
Concordance		98,1%	

Total + 1
 Total - 103

Level L1

Laboratories number 13
 Number of positive results per laboratory: 8

Laboratory	Number of positive results	Interlaboratories pairs with the same result	Total interlaboratories pairs number
A	7	636	768
C	8	712	768
E	8	712	768
F	7	636	768
G	6	556	768
H	6	556	768
I	8	712	768
J	8	712	768
K	8	712	768
L	7	636	768
M	8	712	768
N	8	712	768
O	8	712	768
Total		8 716	9 984
Concordance		87,3%	

Total + 97
 Total - 7

Level L2

Laboratories number 13
 Number of positive results per laboratory: 8

Laboratory	Number of positive results	Interlaboratories pairs with the same result	Total interlaboratories pairs number
A	8	768	768
C	8	768	768
E	8	768	768
F	8	768	768
G	8	768	768
H	8	768	768
I	8	768	768
J	8	768	768
K	8	768	768
L	8	768	768
M	8	768	768
N	8	768	768
O	8	768	768
Total		9 984	9 984
Concordance		100,0%	

Total + 104
 Total - 0