STATENS VETERINÄRMEDICINSKA ANSTALT

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Report from the 9th Scandinavian inter laboratory comparison study on detection of *Salmonella* in material from animal production 2016

The Scandinavian inter laboratory comparison study on detection of *Salmonella* in material from animal production is performed in collaboration between the NRL:s (National Reference Laboratories) in Denmark, Finland, Norway and Sweden. This study was the ninth since 2006 and the faecal matrix was Bovine faeces.

As a part of the responsibility of being a NRL there is a demand from the EURL-Salmonella in Bilthoven that regional laboratories within each member state must participate in this type of inter laboratory comparison studies to be entitled to perform *Salmonella* analyses for public control.

After an initial contact between the NRL:s in Denmark, Finland, Norway and Sweden it was decided that the National Veterinary Institute (SVA) in Sweden should organize the study of 2016. SVA was provided with addresses to 20 conceivable participating laboratories in all four countries. The laboratories were invited and 19 accepted and participated. *(attachment 1)*

The study started on the 3rd of February 2016 by the off transmission of 25 ampoules containing different types of Salmonella in various concentrations, together with Bovine faeces as matrix to each participating laboratory. The matrix should be kept in +5°C and the ampoules in -20°C to the 8th of February when the analysing for presence or absence of Salmonella should start. However, for different reasons, three laboratories started the analysis on the 9th, 10thand 15th of February.

Determination of serotype was not required.

The test report should be returned to SVA no later than the 26th of February 2016, a demand that all participating laboratories met up to.

Purpose of the inter laboratory studies

- Evaluation of the laboratories individual ability to detect *Salmonella* in different matrixes.
- Comparison of different laboratories performance.
- Give each participating laboratory an opportunity to evaluate its own ability to detect *Salmonella* in different matrixes.
- Give each participating laboratory an opportunity to detect, and attend to, eventual inabilities to detect *Salmonella* in different matrixes.
- Give each NRL, as well as the participating laboratories, a possibility to evaluate the performance of different media used.
- Give each NRL a possibility to evaluate the performance of the regional laboratories in their own country.
- Give each NRL a possibility to help and guide any regional laboratory if needed.
- Give each NRL help in the work with quality assurance regarding its field of work in a national perspective.
- Comparison of different analytical methods ability to detect *Salmonella* as well within the same laboratory as between different laboratories.

Material and methods

Salmonella isolates used

Ampoules containing two different freeze dried serovars of *Salmonella* were produced at SVA.

To define the concentrations 10 ampoules of each concentration were analysed. The content of each ampoule was dissolved in 2 ml of buffered peptone water (BPW), spread in standard plastic petri dishes and covered with Trypton Glucose Extract agar (TGE agar). The TGE plates were thereafter incubated at 37° C for 24 h and the number of colonies was counted. The results are described in Attachment 2. *(Attachment 2)*

Obtained concentrations

- *Salmonella* Dublin 15 CFU/ampoule
- *Salmonella* Dublin 90 CFU/ampoule
- *Salmonella* Typhimurium 20 CFU/ ampoule
- *Salmonella* Typhimurium (H_2S negative) 75 CFU/ ampoule
- Blanks 0 CFU/ ampoule

The ampoules were kept at -70°C until the delivery of the inter laboratory study on the 3rd of February 2016. For each laboratory 25 ampoules were enumerated 1 to 25, with a distribution of serovars and concentrations according to the table under "Delivery" below.

To obstruct eventual comparison of results between participants the laboratories were subdivided in five different groups and the enumeration was thereafter done in five different ways, one for each group.

Faecal Matrix

Bovine faeces were sampled from a *Salmonella* free and clinically healthy test herd belonging to the Swedish University of Agricultural Sciences on the morning of the 2nd of February.

The faeces was weighed and delivered together with the ampoules to the participating laboratories. The batch was simultaneously confirmed free from *Salmonella*.

Delivery

Containers marked as biological substance category B (UN 3373) containing the reference material and the Bovine faeces were sent to each participating laboratory by a door to door

courier service (Cargo Logistics Express AB CLX). The containers had specific cooling devices to keep a temperature of +4 - +8 °C for 48h. The participants were requested to note the date, time and temperature at arrival. Furthermore, a Temp-logger was added in the packages. These temp-loggers were sent back to SVA giving SVA the possibility to control the variation in temperature every 30th minute from sending to arrival.

The containers were collected at SVA at 12.00 on the 3rd of February and all containers should have been delivered before 16.00 the 5th of February. This was achieved for all but one laboratory in Finland who received their container on the 9th of February. However, also that laboratory performed well in the test with 25 correct answers. *(Attachment 3)*

Each delivery contained

- 25 ampoules marked 1-24:
  - 5 Blanks — 0 CFU/ampoule
  - 5 ampoules of *Salmonella* Dublin containing — 15 CFU/ampoule
  - 5 ampoules of *Salmonella* Dublin containing — 90 CFU/ampoule
  - 5 ampoules of *Salmonella* Typhimurium containing — 20 CFU/ampoule
  - 5 ampoules of *Salmonella* Typhimurium (no H_2S) containing — 75 CFU/ampoule
- 300 g of Bovine faeces
- The individual laboratory code (Lab code 1-19)

Analytical methods

The prescribed method of the 9th Scandinavian Inter Laboratory Comparison Study was

MSRV (EN-ISO 6579:2002/A1: 2007: Amendment 1: Annex D).

Further, all laboratories could additionally analyse the samples by NMKL (nr 71:1999 5th ed.) and/or Selenite enrichment, (ISO 6575: 1993 3rd ed.).

One laboratory, only accredited for Salmonella analysis on food samples, participated voluntary and did only analyse the samples using NMKL (nr 71:1999 5th ed.).

As for plating-out Xylose Lysine Desoxycholate agar (XLD) was prescribed.

A second plating-out medium was obligatory. However, the choice of plating-out medium was optional. The medium used are shown in attachment 4. *(Attachment 4)*

The comparison study shall evaluate the normal procedures of each laboratory´s handling of this type of samples. The study should therefore be executed according to each laboratory´s normal routines.

Results

The results are shown in attachments 4 to 5.

Attachment 4 Results of the MSRV method (18 laboratories)
Attachment 5 Results of the NMKL & Selenite enrichment methods (4+1 laboratories)

The concentration of Salmonella will be mentioned by numbers
The methods used will be named "MSRV, NMKL and Selenite respectively.

MSRV (5 ampoules/Serovar x 18 laboratories)

- 12 laboratories scored 25 correct answers.
- 1 Laboratory:
  - Incorrectly reported 1 false positive Blanc
  - Did not find 1 of the non H_2S-producing *S*. Typhimurium.
- 2 Laboratories
  - Did not find any of the non H_2S-producing *S*. Typhimurium.
- 2 Laboratories
  - Did found some but not all of the non H_2S-producing *S*. Typhimurium.
- 1 Laboratory did not find 1 of the samples containing S. Dublin in high concentration.

NMKL (5 ampoules/Serovar x 4 laboratories)

- 1 laboratory scored 25 correct answers
- 1 Laboratory
  - Incorrectly reported 2 false positive Blancs
  - Found only 3 of the S. Dublin in high concentration.
  - Found only 2 of the non H2S-producing *S*. Typhimurium.
- 1 Laboratory:
  - Did not find any of the S. Dublin in low concentration.
  - Found only 2 of the S. Dublin in high concentration.
  - Did not find any of the non H_2S-producing *S*. Typhimurium.
  - Found only 2 of the *S*. Typhimurium in low concentration.
- 1 Laboratory:
  - Did not find 2 of the non H_2S-producing *S*. Typhimurium.
  - Found 4 of the *S*. Typhimurium in low concentration.

Selenite (5 ampoules/Serovar x 1 laboratories)

- The Laboratory:
  - Found 13 positive samples on both XLD & BG
  - Did not find any of the non H_2S-producing *S*. Typhimurium.
  - Did not find 2 *S*. Dublin in low concentration.
  - Reported no false positive Blanc

Evaluation

- The results have been judged as "Good Performance" or "Below Good Performance" according to the criteria given in attachment 6. *(Attachment 6)*

MSRV

- 14 laboratories obtained "Good Performance"
- 4 laboratories did not obtain "Good Performance".

NMKL

- 1 laboratory obtained "Good Performance".
- 3 laboratories did not obtain "Good Performance".

Selenite Enrichment

- The laboratory did not obtain "Good Performance".

In accordance with the last seven proficiency tests, the final evaluation of the performance of the participating laboratories was only based on their results using MSRV.

All results will also be sent to each country's NRL for any eventual follow up. If the NRL find it necessary, ampoules for a specific serovar can, on request, be sent from SVA to the laboratory failing to meet the demand for that specific serovar. However, no matrix will be added.

Conclusions

Overall the result of this year´s proficiency test shows that quality of the analysing capacity in the Nordic countries ought to be considered as good. However, some laboratories did not reach the demands for a "Good performance".

In the study of 2015 all participating laboratories succeeded in analysing all samples correctly.

However, in this year´s study the introduction of a non H_2S producing strain created a problem for 6 laboratories. For 3 of them they did not find any Salmonella at all in these samples.

In the time period from 2009 to 2014 there has always been some participant that have performed below "Good performance". As the use of parallel analyse using NMKL and Selenite enrichment has been voluntary since 2009, only a part of the participants has used these methods. It has nevertheless been notable that the results using them has rendered a less good result as described in the compilation of the results from 2008 to 2016. In the assessment of the results over time a complicating factor is that all laboratories are not participating every year meaning that the results from different years are not completely comparable. *(Attachment 7)*

The results found in the present study are in line with several other studies including previous Scandinavian inter laboratory studies (2006, 2008, 2009, 2010, 2011, 2012, 2014 & 2015). Taken together they are an incitement for the use of the MSRV method for detection of *Salmonella* in faecal samples from the primary production.

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Attachment 1

Participants in the 9th Scandinavian interlaboratory comparison studies on detection of Salmonella in material from animal production

Institute	Address	Postal address	Country
DTU Veterinærinstituttet Afdeling for Veterinær Diagnostik og Forskning Danmarks Tekniske Universitet	Bülowsvej 27 Bygning 2, rum 109A	1790 København V	Danmark
Eurofins Steins Laboratorium	Ladelundsvej 85	Vejen, 6600	Danmark
Fødevarregionens lab Ringstedt	Søndervang 4	4100 Ringsted	Danmark
SEGES P/S	Vinkelvej 13,	DK-8620 Kjellerup	Danmark
Eurofins Scientific Finland Oy, Kokkola	Kemirantie 1	(PO Box 74), FI-67101 Kokkola	Finland
Fin FurLab Oy Ab	Kungsgårdsvägen 58 A	FI-65380 Vasa	Finland
HakaLab Oy	Teknologiakylä, Teknotalo 1	86600 Haapavesi	Finland
HKScan Finland Oy, Euran laboratorio	Kariniementie 2	FI-27510 Eura	Finland
KVVY-Porilab	Tiedepuisto 4	FI-28600 Pori	Finland
KVVY-Raumalab	Lensunkatu 9	FI-26100 Rauma	Finland
Lauttalab	Metsälinnankatu 30 b 4	FI-32700 Huittinen	Finland
SeiLab	Vaasantie 1 C	FI-60100 Seinäjoki	Finland
Veterinærinstituttet Oslo	Ullevålsveien 68	0106 OSLO	Norge
Veterinærinstituttet Sandnes	Kyrkjeveien 334	4325 Sandnes	Norge
Veterinærinstituttet Trondheim	Tungasletta 2	7047 Trondheim	Norge
Alcontrol Linköping	Olaus Magnus väg 27	583 30 Linköping	Sverige
Eurofins Food & Agro Sweden	Gråbrödragata 5	532 31 Skara	Sverige
Mikrolab Stockholm AB	Kung Hans väg 3	192 68 Sollentuna	Sverige
SVA	-	751 89 Uppsala	Sverige

Attachment 2

Number of CFU/Ampoule of each serovar.

S. Dublin (31-04)15 CFU

Sample	Plate 1 No of CFU	log CFU/Ampoule
1	14	1,15
2	10	1,00
3	14	1,15
4	13	1,11
5	16	1,20
6	15	1,18
7	11	1,04
8	13	1,11
9	13	1,11
10	12	1,08

S. Dublin (2007)90 CFU

Sample	Plate 1 No of CFU	log CFU/Ampoule
1	89	1,95
2	103	2,01
3	75	1,88
4	89	1,95
5	75	1,88
6	89	1,95
7	84	1,92
8	88	1,94
9	86	1,93
10	78	1,89

S. Tm (506-04) 20 CFU

Sample	Plate 1 No of CFU	log CFU/Ampoule
1	22	1,34
2	21	1,32
3	25	1,40
4	22	1,34
5	28	1,45
6	26	1,41
7	16	1,20
8	16	1,20
9	33	1,52
10	25	1,40

S. Tm (382-12) 75 CFU Ej H_2S

Sample	Plate 1 No of CFU	log CFU/Ampoule
1	85	1,93
2	84	1,92
3	76	1,88
4	71	1,85
5	76	1,88
6	72	1,86
7	67	1,83
8	84	1,92
9	69	1,84
10	70	1,85

S. Dublin (31-04)15 CFU

	CFU/ampoule	log CFU/ampoule
Mv	13	**1,11**
s	2	0,06
Min	10	1,00
Max	16	**1,20**
Max-Min	6	0,20

S. Dublin (2007)90 CFU

	CFU/ampoule	log CFU/ampoule
Mv	86	**1,93**
s	8	0,04
Min	75	1,88
Max	103	**2,01**
Max-Min	28	0,14

S. Tm (506-04) 20 CFU

	CFU/ampoule	log CFU/ampoule
Mv	23	**1,36**
s	5	0,10
Min	16	1,20
Max	33	**1,52**
Max-Min	17	0,31

S. Tm (382-12) 75 CFU Ej H_2S

	CFU/ampoule	log CFU/ampoule
Mv	75	**1,88**
s	7	0,04
Min	67	1,83
Max	85	**1,93**
Max-Min	18	0,10

Demand: Homogeniety (s): < 0,15 (log); MaxMin < 0,5 (log)

Attachment 3

Duration of transport, Temp at arrival & Start of Analysis

Laboratory	Sent Date	Arrival Date	Arrival Time	Temp[1] (°C)	Start of Analysis
DTU Veterinærinstituttet	16-02-04	16-02-04	-	-	16-02-08
Eurofins Steins Laboratorium	16-02-04	16-02-05	-	- / 4	16-02-08
Fødevarregionens lab Ringstedt	16-02-04	16-02-04	14.30	7,5	16-02-08
SEGES P/S	16-02-04	16-02-04	15.30	5 / 2,5	16-02-08
Eurofins Scientific Kokkola	16-02-04	16-02-05	13.00	4 / 4	16-02-08
Fin FurLab Oy Ab	16-02-04	16-02-05	12.05	9,3	16-02-08
HakaLab Oy	16-02-04	**16-02-09**	09.00	- /10	**16-02-09**
HKScan, Euran laboratorio	16-02-04	16-02-04	13.30	10,9	16-02-08
KVVY-Porilab	16-02-04	16-02-04	15.00	8	16-02-08
KVVY-Raumalab	16-02-04	16-02-04	-	7	**16-02-15**
Lauttalab	16-02-04	16-02-04	14.00	-	**16-02-10**
SeiLab	16-02-04	16-02-05	09.35	0,6/0,6	16-02-08
Veterinærinstituttet Oslo	16-02-04	16-02-04	13.50	13/2,5	16-02-08
Veterinærinstituttet Sandnes	16-02-04	16-02-04	13.30	10/4	16-02-08
Veterinærinstituttet Trondheim	16-02-04	16-02-04	13.00	5,3/4	16-02-08
Alcontrol Linköping	16-02-04	16-02-04	em	- / 5,5	16-02-08
Eurofins Food & Agro Sweden	16-02-04	16-02-04	pm	- / 3,5	16-02-08
Mikrolab Stockholm AB	16-02-04	16-02-04	-	4	16-02-08
SVA	16-02-04	16-02-05	12.00	4	16-02-08

[1] Reported temperatur/According to templogger (for 10 laboratories only)

RESULTS OF ISOLATION USING MSRV (9th Scandinavian Interlaboratory comparison of Salonella in material from animal production)

Salmonella	Cfu/ ampoul	Lab 1 *)	Lab 2 XLD(n)	Lab 2 BG	Lab 3 XLD(n)	Lab 3 BSA	Lab 4 XLD	Lab 4 HS	Lab 5 XLD	Lab 5 RB	Lab 6 XLD	Lab 6 BG	Lab 7 XLD(n)	Lab 7 BG	Lab 8 **) XLD	Lab 8 BG	Lab 9 **) XLD	Lab 9 BG	Lab 10 XLD	Lab 10 BG	Lab 11 XLD	Lab 11 öNöZ	Lab 12 ***) XLD	Lab 12 RB	Lab 13 ***) XLD	Lab 13 RB	Lab 14 XLD	Lab 14 HEA	Lab 15 XLD	Lab 15 öNöz	Lab 16 XLD	Lab 16 RS	Lab 17 XLD(n)	Lab 17 RB	Lab 18 XLD	Lab 18 öNöz	Lab 19 XLD	Lab 19 BG	Demand NRL (correct/total)
Blank	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	
Blank	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	
Blank	0		-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	5/5
Blank	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	
Blank	0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-		-	-	-	-	-	-	-	-	-	-	-	-	
S. Dublin	15		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Dublin	15		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Dublin	15		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	≥ 4/5
S. Dublin	15		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Dublin	15		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Dublin	90		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Dublin	90		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	-	-	+	+	+	+	+	+	
S. Dublin	90		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	≥ 4/5
S. Dublin	90		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Dublin	90		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Typhimurium (ej H_2S)	75		+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	+	+	+		-		-	+	+	+	+	+	+	+	+	+	-	+	
S. Typhimurium (ej H_2S)	75		+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+		-		-	+	+	+	+	+	+	+	+	+	+	-	
S. Typhimurium (ej H_2S)	75		+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+		-		+	+	+	+	+	+	+	+	+	+	+	-	≥ 4/5
S. Typhimurium (ej H_2S)	75		+	+	+	+	+	+	+	+	-	-	+	+	+	+	-	-	+	+	+	+		-		+	+	+	+	+	+	+	+	+	+	+	-	
S. Typhimurium (ej H_2S)	75		+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	+		-		-	+	+	+	+	+	+	+	+	+	+	-	
S. Typhimurium	20		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Typhimurium	20		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Typhimurium	20		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	≥ 4/5
S. Typhimurium	20		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
S. Typhimurium	20		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+	+	+	+	+	+	+	+	+	+	
			25		25		25		25		24		25		23		20		25		25		20		22		25		24		25		25		25		25		

(+) = Salmonella Detected after 24 h
(+) = Salmonella Detected after 48 h
(-) = Salmonella not detected
Red = Not a Corecct answer
Good Performance
Below Good Performance

Second Plating-out medium used			Used by
XLD (n)	Xylose Lysine Deoxycholate agar (+0,15% neomycin)	(Himedia / Thermo / Oxoid)	4 Laboratories
XLD	Xylose Lysine Deoxycholate agar	(Himedia / Thermo / Oxoid / LabM)	14 Laboratories
BG	Briliant green agar	(Himedia / Oxoid / Merc)	7 Laboratories
BSA	Briliant Salmonella Agar	(Thermo)	1 Laboratories
RB	Rambach agar (Merc)	(Merc / Tammertutkanmaljat OY)	4 Laboratories
HS	Harlequin Salmonella ABC	(LabM)	1 Laboratories
HEA	Hectoen Enteric Agar	(Becton Dickinson Difco)	1 Laboratories
RS	Rapid Salmonella (BIORAD 356-4705)	(Biorad)	1 Laboratories
öNöZ	(Himedia M 573)	(Himedia)	3 Laboratories

*) Does only analyze Food and therefor only use NMKL no 71 5ed

**) Agar used for isolation of suspected colonies of *Salmonella*: Difco/244400 + Lactose, Sucrose & Bromthymolblue & Crystalpurple

***) No result for XLD given but the laboratory note that they use XLD

Attachment 5

RESULTS OF ISOLATION USING NMKL (4 lab.)

Salmonella	Cfu/ ampoul	Lab 1 XLD(n)	Lab 1 BG	Lab 2 XLD	Lab 2 BG	Lab 16 XLD	Lab 16 RS	Lab 17 XLD	Lab 17 BG
Blank	0	+	+	-	-	-	-	-	-
Blank	0	-	-	-	-	-	-	-	-
Blank	0	-	-	-	-	-	-	-	-
Blank	0	-	+	-	-	-	-	-	-
Blank	0			-	-	-	-	-	-
S. Dublin	15	+	+	-	-	+	+	-	+
S. Dublin	15	+	+	-	-	+	+	+	+
S. Dublin	15	+	+	-	-	+	+	+	+
S. Dublin	15	+	+	-	-	+	+	+	+
S. Dublin	15	+	+	-	-	+	+	+	+
S. Dublin	90	-	-	+	+	+	+	+	+
S. Dublin	90	-	+	-	-	+	+	-	+
S. Dublin	90	-	+	-	-	+	+	+	+
S. Dublin	90	-	-	-	-	+	+	+	+
S. Dublin	90	-	+	+	+	+	+	+	+
S. Typhimurium (ej H_2S)	75	+	+	-	-	+	+	-	-
S. Typhimurium (ej H_2S)	75	-	-	-	-	+	+	+	+
S. Typhimurium (ej H_2S)	75	-	-	-	-	+	+	-	-
S. Typhimurium (ej H_2S)	75	-	-	-	-	+	+	+	+
S. Typhimurium (ej H_2S)	75	-	+	-	-	+	+	+	+
S. Typhimurium	20	+	+	+	+	+	+	-	-
S. Typhimurium	20	+	+	-	-	+	+	+	+
S. Typhimurium	20	+	+	-	-	+	+	-	+
S. Typhimurium	20	+	+	-	-	+	+	+	+
S. Typhimurium	20	+	+	+	+	+	+	+	+
		15		9		25		22	

RESULTS OF ISOLATION USING Selenit enrichment (1 lab.)

Salmonella	Cfu/ ampoul	Lab 19 XLD	Lab 19 BG
Blank	0	-	-
Blank	0	-	-
Blank	0	-	-
Blank	0	-	-
Blank	0	-	-
S. Dublin	15	-	-
S. Dublin	15	+	+
S. Dublin	15	-	-
S. Dublin	15	+	+
S. Dublin	15	+	+
S. Dublin	90	+	+
S. Dublin	90	+	+
S. Dublin	90	+	+
S. Dublin	90	+	+
S. Dublin	90	+	+
S. Typhimurium (ej H_2S)	75	-	-
S. Typhimurium (ej H_2S)	75	-	-
S. Typhimurium (ej H_2S)	75	-	-
S. Typhimurium (ej H_2S)	75	-	-
S. Typhimurium (ej H_2S)	75	-	-
S. Typhimurium	20	+	+
S. Typhimurium	20	+	+
S. Typhimurium	20	+	+
S. Typhimurium	20	+	+
S. Typhimurium	20	+	+
		18	

(+) = Salmonella Detected after 24 h
(+) = Salmonella Detected after 48 h
(-) = Salmonella not detected
Red = Not a Corecct answer
Good Performance
Below Good Performance

Second Plating-out medium used			Used by
XLD	Xylose Lysine Deoxycholate agar	(Himedia/ Thermo/ Oxoid/ LabM)	4 Laboratories
XLD(n)	XLD (+0,15% neomycin)	(Himedia / Thermo / Oxoid)	1 Laboratories
BG	Briliant green agar	(Himedia/ Oxoid/ Merc)	4 Laboratories
RS	Rapid Salmonella	(Biorad)	1 Laboratories

Attachment 6

Criteria for good performance in the 9th Scandinavian inter laboratory comparison study on detection of *Salmonella* in material from animal production 2016

Good performance

If the participating laboratory did detect

5 of 5 ampoules of	Blanks	0 cfu
≥4 of 5 ampoules of	*S*. Dublin	15 cfu
≥4 of 5 ampoules of	*S*. Dublin	90 cfu
≥4 of 5 ampoules of	*S*. Typhimurium	20 cfu
≥4 of 5 ampoules of	*S*. Typhimurium (H_2S neg)	75 cfu

≥20 correct analyses

Below Good perfomance (Needs to be followed up by NRL)

If the participating laboratory did detect

≥1 False positive

<4 ampoules of	*S*. Dublin	15 cfu
<4 ampoules of	*S*. Dublin	90 cfu
<4 ampoules of	*S*. Typhimurium	20 cfu
<4 ampoules of	*S*. Typhimurium (H_2S neg)	75 cfu

<20 correct answers

NMKL (no 71:1999 5:th edition) or Selenite enrichment, (ISO 6575: 1993 3.e edition) is not approved analytical methods for detecting Salmonella in faecal samples taken in public control in Denmark. Therefore, it has, in collaboration between the NRL:s in Denmark, Finland, Norway and Sweden been decided that the evaluation of the performance of the participating laboratories will only be based on their results using the MSRV method (EN-ISO 6579:2002/A1: 2007: Amendment 1: Annex D).

Attachment 7

Compilation of results stratified by year, detection method and concentration of serovars used

Year		2008		2009		2010			2011			2012		2014		2015	2016	
No. Participants		14		9		21			23			29		26		20	19	
Matrix		Bovine		Pig		Pig			Chicken			Bovine		Pig		Chicken	Bovine	
Lab with Good Performance MSRV		100%		67%		76%			91%			93%		88%		100%	78%	
Serovar		S. Dublin		S. Typhimurium		S. Typhimurium			S. Typhimurium			S. Typhimurium		S. Typhimurium		S. Typhimurium	S. Typhimurium	
No. CFU/Ampoule		15	175	20	200	3	20	200	3	20	200	45	300	25	400	50	20	70 (noH_2S)
Detected Isolates	MSRV	70/70	70/70	25/45	45/45	20/40	67/100	93/100	18/46	96/115	110/115	141/145	142/145	114/115	114/115	95/95	90/90	70/90
		100%	100%	56%	100%	50%	67%	93%	39%	83%	96%	97%	98%	97%	99%	100%	100%	78%
	NMKL	19/50	25/50	3/25	12/25	1/12	9/30	12/30	0/30	7/30	12/30	8/20	9/20	10/20	14/20	15/15	16/20	10/20
		38%	50%	12%	48%	8%	30%	40%	0%	23%	40%	40%	45%	50%	70%	100%	80%	50%
	Selenit	10/35	16/35	9/10	9/10	4/6	13/15	13/15	0/5	0/5	1/5						5/5	0/5
		29%	46%	90%	90%	67%	87%	87%	0%	0%	20%						100%	0%
Serovar		S. Enteritidis		S. Enteritidis		S. Enteritidis			S. Enteritidis			S. Dublin		S. Enteritidis		S. Infantis	S. Dublin	
No. CFU/Ampoule		45	1500	50	500	25	550		25	550		50	450	100	1000	35	15	90
Detected Isolates	MSRV	70/70	70/70	45/45	45/45	97/100	100/100		114/115	115/115		138/145	143/145	115/115	115/115	95/95	90/90	89/90
		100%	100%	100%	100%	97%	100%		99%	100%		95%	99%	100%	100%	100%	100%	99%
	NMKL	33/50	50/50	24/25	25/25	27/30	30/30		26/30	26/30		6/20	9/20	16/20	20/20	15/15	15/20	15/20
		66%	100%	96%	100%	90%	100%		87%	87%		30%	45%	80%	100%	100%	75%	75%
	Selenit	15/35	25/35	7/10	10/10	13/15	15/15		1/5	4/5							3/5	5/5
		43%	71%	70%	100%	87%	100%		20%	80%							75%	100%

Matrix: Faeces from animal species mentioned
MSRV: MSRV (EN-ISO 6579:2002/A1: 2007: Amendment 1: Annex D)
NMKL: NMKL (nr 71:1999 5th ed.)
Selenite: Selenite enrichment, (ISO 6575: 1993 3rd ed.)
Results are described as the total number of detected isolates/total number analysed isolates for each method, serovar and concentration respectively. The results are presented both nominally and in percentage.