National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

EURL- Salmonella

Interlaboratory comparison study on the detection of *Salmonella* in samples from primary production stage (2017)

EURL Salmonella

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EURL *Salmonella* Detection study PPS 2017

- Matrix: *Salmonella* free chicken faeces (SPF farm)
- Contaminated at EURL with high and low concentration of *Salmonella*



Pre-test: Stability of samples (1)

- 25 gram *Salmonella* free chicken faeces
  - Laying hens
  - Same flock: pre-test and study samples
- Strain*: Salmonella* Infantis
  - › Low: 8-12 cfu/sample
  - › High: 52 cfu/sample

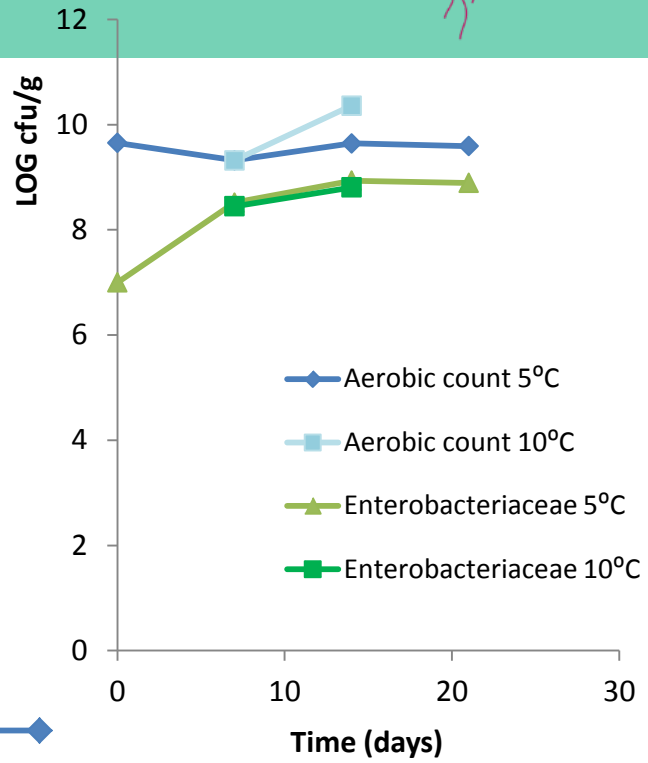
Pre-test: Stability of samples (2)

- Storage conditions: 5 and 10 °C for up to 3 weeks

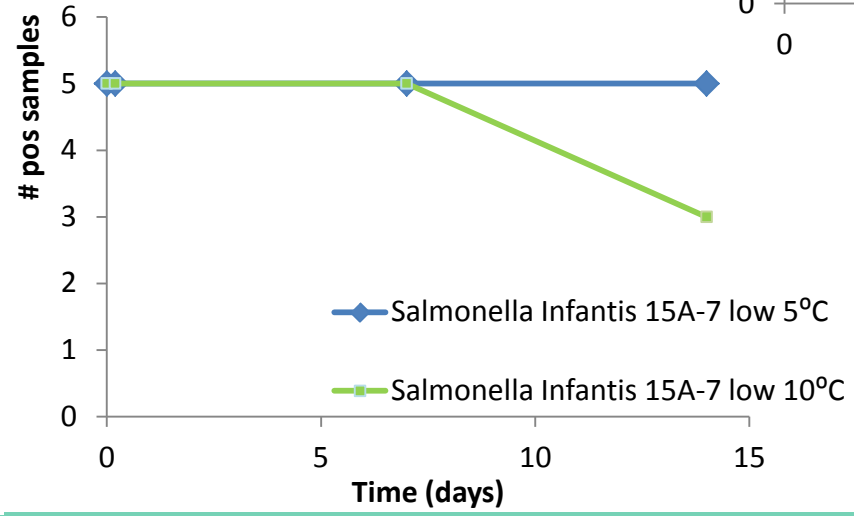
- Test for:
  - *Salmonella:* ISO 6579 annex D (MSRV)
  - Total aerobic count: ISO 4833
  - *Enterobacteriaceae:* ISO 21528-2

Conclusion Pre-tests

- Aerobic count is stable for 3 weeks
- *Enterobacteriaceae* increases



- *Salmonella*: # pos samples stable for two weeks



Study design

- 25 g chicken faeces

- Contaminated with *Salmonella* Infantis
  - 6 Low level SI: 10-15 cfu
  - 6 High level SI: 50-100 cfu
  - 6 Blank

- 2 Process controls
  - C1: blank
  - C2: positive control labs

Participants

36 Laboratories participated:

- 29 NRLs from 28 EU Member States
- 3 NRLs from EU candidate Member States
- 3 NRLs from European Free Trade Associations (EFTA)
- 1 NRL from a third country (on request of DG-Sante)

Transport

- Transport time:
  - 30 parcels: 0-1 day
  - 3 parcels: 2 days
  - 1 parcel : 3 days
  - 2 parcels: 4-6 days

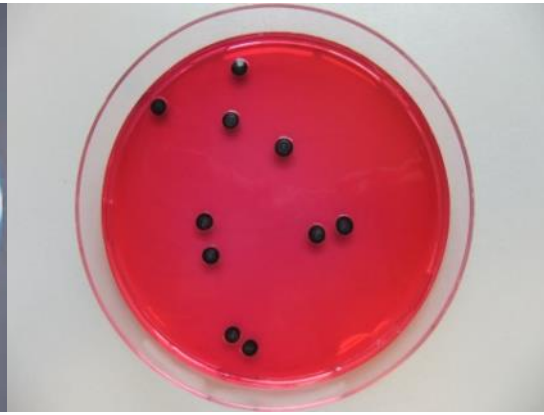
- Temperature during transport and storage:
  - temperature probe in sample bag
  - transport temperature: predominantly -4,5 and 6°C (> 10 °C: lab 13 and 36)
  - storage temperature: mostly 0-9°C (13-23°C for lab 13 and 18)

Method

Prescribed: ISO 6579 (Annex D)

- Selective enrichment on MSRV
- Isolation medium XLD & 2nd agar of choice



Samples: Background flora

Date of testing	Aerobic bacteria cfu / g	*Enterobacteriaceae* cfu / g
7 March 2017	4.2 x10 ^{8}	8.7 x 10 ^{4}
20 March 2017, after storage at 5 °C	1.0 x 10 ^{8}	5.5 x 10 ^{4}

Samples: Artificial contamination

Date of testing	Sample	Low level SI cfu / sample	High level SI cfu / sample
09-03-2017	Inoculum of diluted culture	17	55
20-03-2017	Inoculated chicken faeces, stored 5°C MPN (95% confidence limit)	22 (8.5 -56)	35 (11 - 110)

Results: High concentration *S.* infantis

Results: Low concentration *S.* Infantis

Samples: specificity, sensitivity, accuracy

Samples: chicken faeces	Laboratories	n = 36
Blank n=6	No. of samples No. of negative samples Specificity in %	216 213* 99
Low level (SI) n=6	No. of samples No. of positive samples Sensitivity in %	216 213 99
High level (SI) n=6	No. of samples No. of positive samples Sensitivity in %	216 214 99
All faeces samples with SI	No. of samples No. of positive samples Sensitivity in %	432 427 99
All faeces samples (positive and negative)	No. of samples No. of correct samples Accuracy in %	648 640 99

1 laboratory (labcode 18) : 3 positive blanks: poor performance

Control samples: specificity, sensitivity, accuracy

Control samples	Laboratories	n = 36
Procedure control Blank (BPW) n = 1	No. of samples No. of negative samples Specificity in %	36 36 100
Positive control (Own *Salmonella*) n= 1	No. of samples No. of positive samples Sensitivity in %	36 36 100
All control samples n = 2	No. of samples No. of correct samples Accuracy in %	72 72 100

1 laboratory (labcode 16) : control samples were switched: moderate performance

Conclusions PPS 2017

Control samples:

- Excellent performance: 100% correct scores
- 1 lab (labcode 16) switched control samples: moderate performance

Chicken faeces samples:

- High level SI: all but two labs scored all samples positive
- Low level SI: all but 3 labs scores all samples positive
- Blank samples: 35 labs scored all samples negative
  1 lab (labcode 18) scored 3/6 samples positive: poor performance

Overall conclusions

- 34 laboratories scored good performance
- 1 laboratory scored moderate performance
- 1 laboratory scored poor performance

Thank you all for your participation in this study

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