

Activities of the NRL - *Salmonella* Switzerland

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29th May 2019, 24th workshop of the European Reference Laboratory for *Salmonella*, Amersfoort, the Netherlands



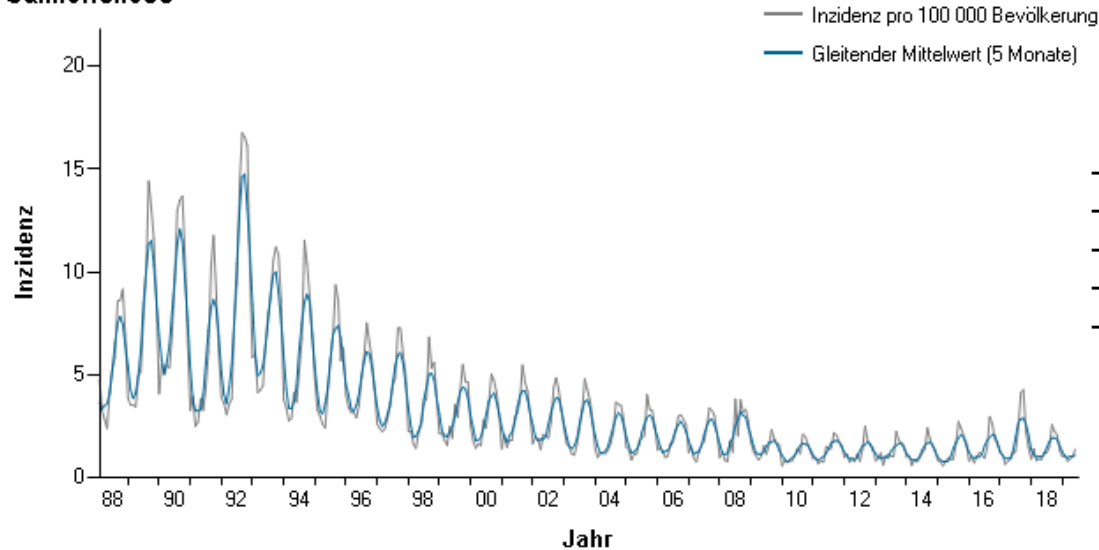
- Current data on *Salmonella* in Switzerland
- National control programme on *Salmonella* and laboratories involved
- Proficiency Testings
 - Study design
 - Results
- Outlook



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Humane cases of salmonellosis

Salmonellose



- 1580 notified cases in 2018
- steady state since 2009
- 38% *S. Enteritidis*
- 13% *S. Typhimurium*
- 11% *S. Typhimurium*, monophasic

Results of the European base line studies on *Salmonella*

Prevalence of *Salmonella* in laying hens – 2005/2006 (EU 2004/2005)

1.3 % pos.

Prevalence of *Salmonella* in broilers – 2007 (EU 2005/2006)

0.3 % pos.

Prevalence of *Salmonella* in slaughter pigs – 2007/2008 (EU2006/2007)

2.3 % pos.

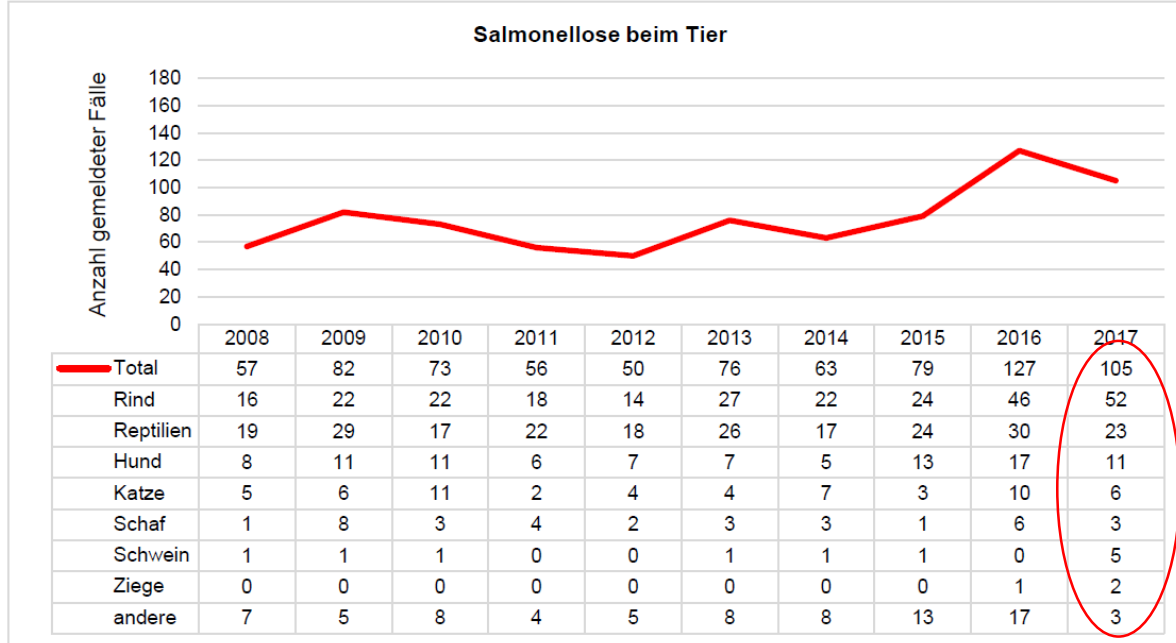
Prevalence of *Salmonella* (+MRSA) in breeding pigs – 2008 (EU 2008)

13 % pos.

Prevalence of *Salmonella* (+ *Campylobacter*) in carcasses (+broilers) – 2008 (EU 2008)

2.6% pos.

Salmonellosis in animals



- very few cases
- mostly cattle

Abbildung SA—2: Anzahl gemeldeter Salmonellose-Fälle beim Tier 2008–2017.
(Quelle: [InfoSM](#), BLV; Stand März 2018)

Salmonella infection in Poultry

Nutzungsrichtung	Anzahl in TVD gemeldeter Herden	Anzahl Herden, für die der Untersuchungsantrag aus TVD mit Herden-ID verwendet wurde	Anzahl Seuchenfälle	Prävalenz
Zucht Legelinie	116	30 (26%)	0	0.0%
Zucht Mastlinie	66	50 (76%)	0	0.0%
Legehennen	812	384 (47%)	4	1.0%
Mastpoulets	3604	499 (14%)	1	0.2%
Masttruten	92	18 (20%)	1	5.6%

Salmonella contamination in food

3532 samples of fresh Swiss **poultry meat**: 27 positive (0.7%)

- S. Albany (11)
- S. Typhimurium (4)
- S. Infantis (1)
- S. Chester (1)
- S. Welikade (1)
- Salmonella spp. (3)

948 samples of **raw milk cheese**: 0 positive (0%)

National control programme on *Salmonella* in poultry

- ✓ *Salmonella* infection is defined as detection of *Salmonella* in poultry, eggs or carcasses of poultry
- ✓ Programm mandatory for farms with >250 breeding hens, >1000 laying hens, >5000 broilers, > 500 turkeys
- ✓ Notification requirement for veterinarians, laboratories and farmers
- ✓ Control of defined poultry populations and serovars
 - <1% breeding hens for "famous five servers"
 - <1% broilers for ST, incl. monophasic & SE
 - <2% laying hens ST, incl. monophasic & SE



NRL *Salmonella* network in Switzerland

NENT, Vetsuisse faculty of Zurich



apotheken-umschau.de

ILS, Vetsuisse faculty of Zurich



[BewusstKaufen](#)

NRGK, Vetsuisse faculty of Zurich



[Geflügelzucht JUD, Kaltbrunn](#)

Agroscope, Federal Institute



nordzucker.de

ZOBA, Vetsuisse faculty of Berne



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[Business Wire](#)

Approved laboratories for *Salmonella* in Switzerland

- Approval from the Federal Food Safety and Veterinary Office
- Accreditation according ISO 17025- 2017
- Trained personal staff
- Participation in proficiency testings organized by the NRL
- Currently 11 cantonal, private and university laboratories approved



PT for qualitative detection of *Salmonella* according to ISO 6579

Matrix: Chicken feaces from a *Salmonella* free herd

Date of Examination	Detection of <i>Salmonella</i> in 10 g	Aerobic count (CFU/g)	<i>Enterobacteriaceae</i> (CFU/g)
15.09.2009	10 x negative	2.1×10^9	7.2×10^6
04.11.2009	10 x negative	1.5×10^9	1.7×10^6

Salmonella: Lenticules with defined cfu content

Date of Examination/ Laboratory	Mean GKZ Level 0 (CFU/lent.)	Mean GKZ Level 100 (CFU/lent.)	Mean GKZ Level 500 (CFU/lent.)
20.07.2009 / HPA	0	140	529
24.09.2009 / HPA	0	143	542
04.11.2009 / ZOBA	0	136	460



In 2017: **SIGMA-ALDRICH®**



Control and sample plan

Tabelle 2: Übersicht über Proben (P) und Kontrollen (K)

Kodierung Proben und Kontrollen	Kot	Mikrokapsel	Kodierung Proben und Kontrollen	Kot	Mikrokapsel
P 1	ja	SE0	K 1	nein	SE500
P 2	ja	SE500	K 2	nein	SE100
P 3	ja	SE500	K 3	nein	SE100
P 4	ja	SE100	K 4	nein	SE500
P 5	ja	SE100	K 5	nein	SE0
P 6	ja	SE500	K 6	nein	SE0
P 7	ja	SE0	K 7	ja	keine
P 8	ja	SE0	K 8	nein	keine
P 9	ja	SE100			
P 10	ja	SE500			
P 11	ja	SE100			
P 12	ja	SE0			
P 13	ja	SE500			
P 14	ja	SE100			
P 15	ja	SE0			

Controls:

- 2 x blanks
- 2 x high level cfu *Salmonella*
- 2 x low level cfu *Salmonella*
- 1 x faeces only

Samples:

- 5 x blanks
- 5 x high level cfu *Salmonella*
- 5 x low level cfu *Salmonella*

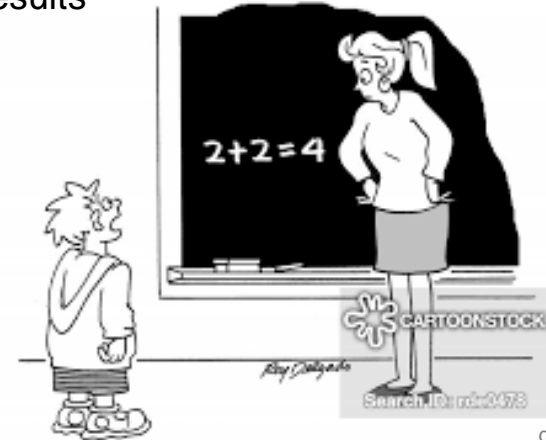
Calculations: separately for controls and samples

Specificity (%): $\frac{\text{Number of **negative** results}}{\text{Number of **expected negative** results}}$

Sensitivity* (%): $\frac{\text{Number of **positive** results}}{\text{Number of **expected positive** results}}$

*for each level of cfu

Accuracy (%): $\frac{\text{Number of **correct** results}}{\text{Number of **all** results}}$



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" That's from the last year the data was available. "

Accuracy for the controls PT 2009

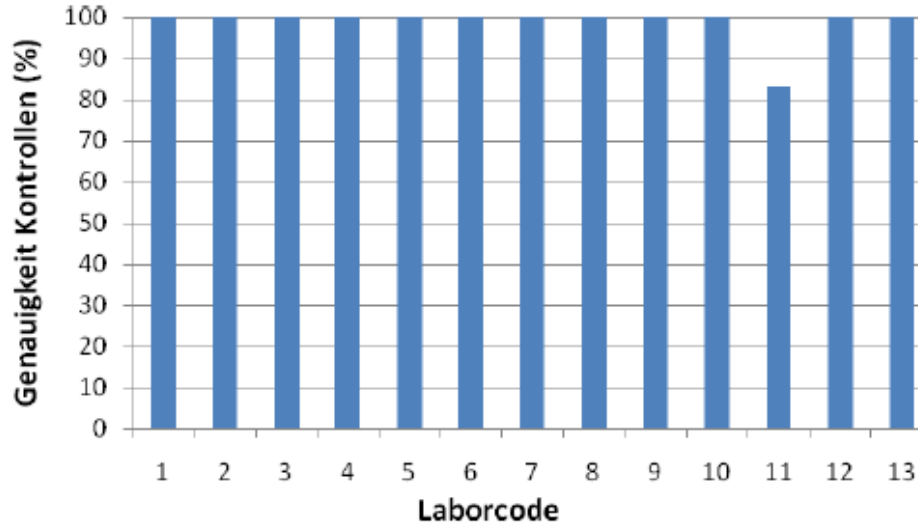


Abbildung 1: Genauigkeit der Ergebnisse für die Kontrollen pro Labor

Accuracy for the samples PT 2009

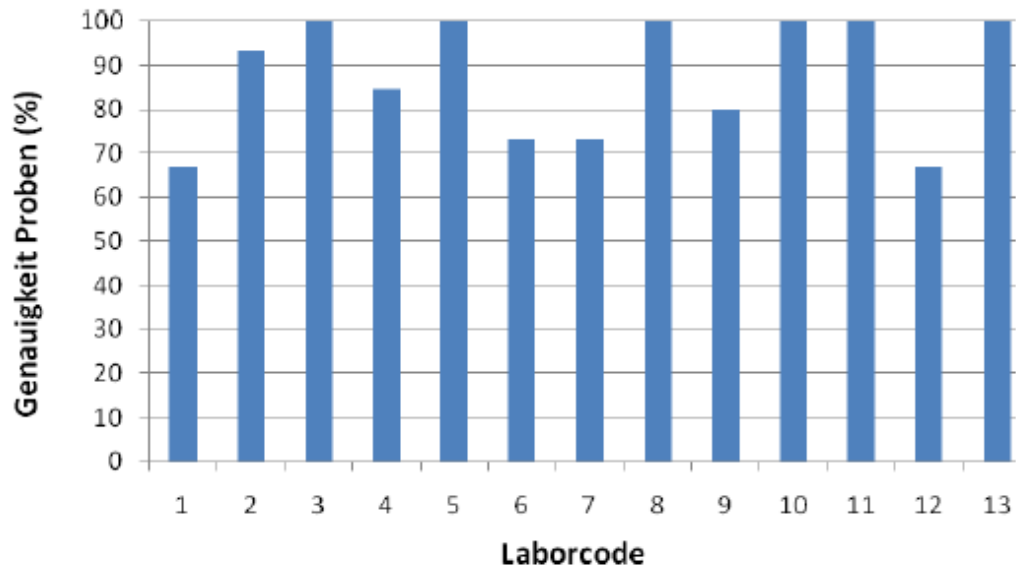


Abbildung 2: Genauigkeit der Ergebnisse für die Proben pro Labor



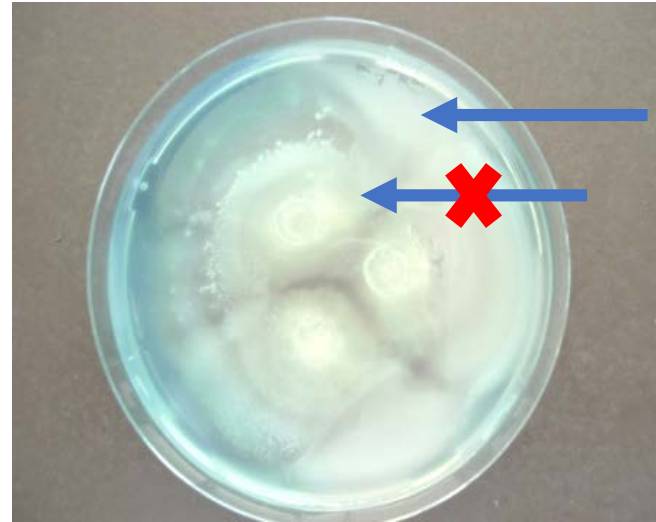
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Modified semi solid Rappaport Vassiliadis Agar

Most problems occurred with

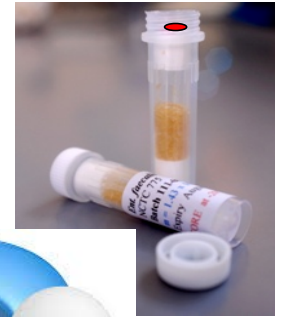
- location of subculturing
- correct texture of the agar

....more PTs were organised !



Results for the samples PT 2009 - 2017

	2009	2010	2011	2013	2017
Specificity (%)	100% (blanks)	100% (blanks)	100% (blanks)	100% (blanks)	100% (blanks)
Sensitivity low level (%)	73.4% (SE100)	92.3% (SE100)	100% (SE50)	98.1% (SE10)	100% (SE100)
Sensitivity high level (%)	89.1% (SE500)	90.8% (SE450)	100% (SE150)	100% (ST50)	100% (SE500)
Accuracy (%)	87.6% (all)	94.4% (all)	100% (all)	99.4% (all)	100% (all)



[Pixabay](https://pixabay.com/)

- Proficiency testing on *Salmonella* spp. "pre-serotyping" in 2019
- Proficiency testings with low contamination levels (if lenticules are commercially available)
- Ongoing organisation of Swiss NRLs

Thank you for your attention!

