

Results and analysis of performance in proficiency test 36

EURL-Campylobacter workshop 2024
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Thank you for your participation and for providing information in the questback reports!

Number of participants

Year	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015
	PT 36	PT 34	PT 31	PT 29	PT 26	PT 23	PT 21	PT 19	PT 17	PT 15
Enumeration	35	35	34	33	33	35	37	36	36	36
	PT 37	PT 35	PT 32	PT 30	PT 27	PT 24	PT 22	PT 20	PT 18	PT 16
Detection & species id	-	32	31	36	29	33	31	34	33	32

Proficiency test No. 36

Enumeration (and species identification)

- Outline
- Methods
- Results and performance of enumeration



PT 36: Outline

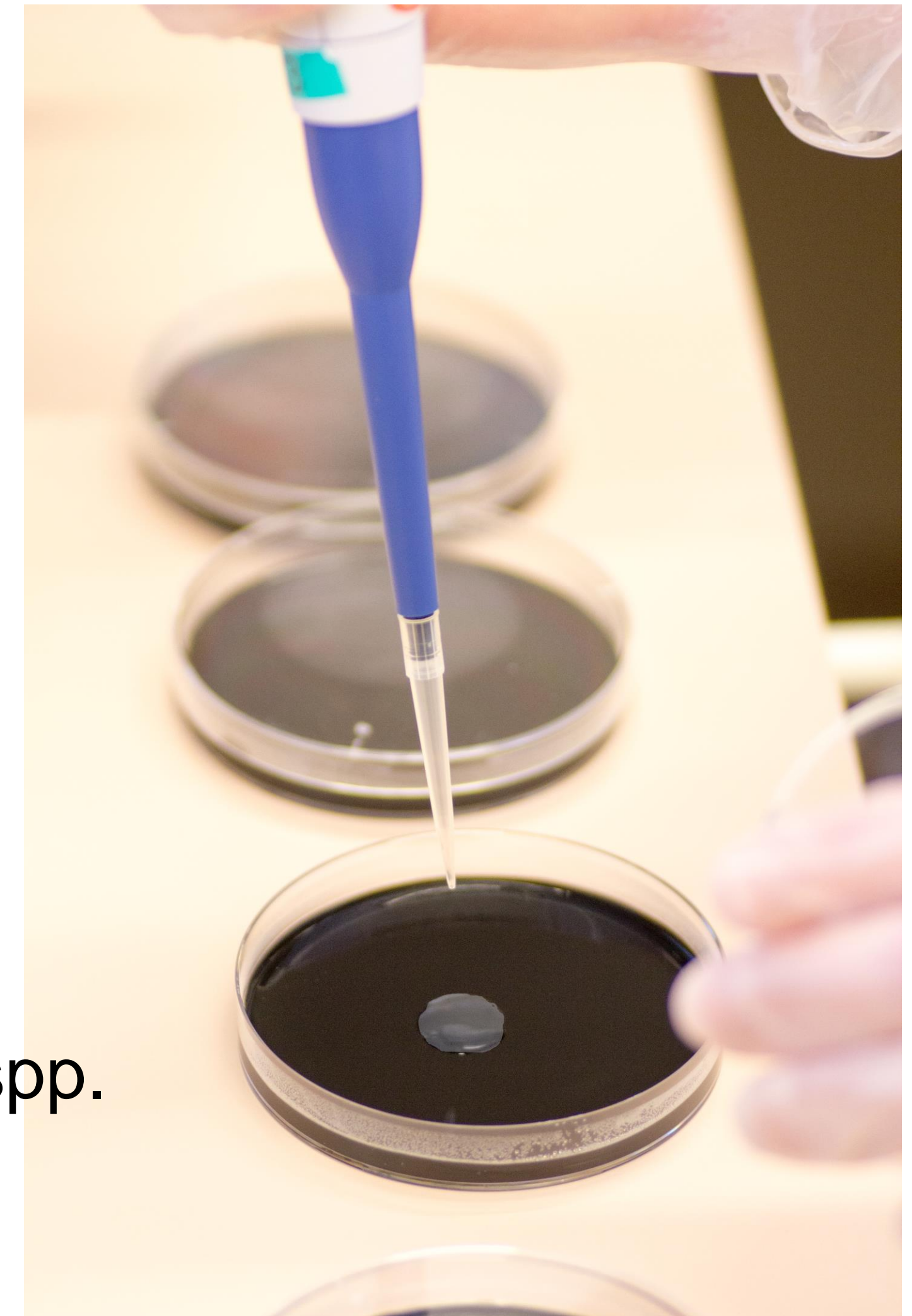
Objective: to assess the performance of the NRLs to enumerate (and voluntary species identify) *Campylobacter* in chicken meat

- Enumeration and confirmation of *Campylobacter* spp. in chicken meat
- Species identification of *Campylobacter* (voluntary)
- Recommended method ISO 10272-2:2017, but other methods allowed
- Should allow enumeration of between 10 and 10^5 cfu *Campylobacter*/g chicken meat

PT 36: Contents and procedure

- One plastic bag of about 130 g frozen chicken meat to be divided into 10 portions of 10 g
- 10 vials with freeze-dried sample (with or without *Campylobacter*)
- Make an initial dilution of 10^{-1} and homogenise
- Follow the method(s) of choice for
 - enumeration
 - species identification (voluntary)

of *Campylobacter* spp.



PT 36: Description of the 10 vials

Sample No.	Species	Level (log cfu/vial)	Batch No.
1	<i>C. jejuni</i>	4.50	SLV336
2	<i>C. jejuni</i>	3.89	SLV401
3	<i>C. coli</i>	6.85	SLV374
4	<i>C. jejuni</i>	4.50	SLV336
5	<i>C. jejuni</i>	3.89	SLV401
6	Negative	4.86	SLV335
7	<i>C. coli</i>	4.85	SLV367
8	<i>Escherichia coli</i>	4.29	SVA079
9	<i>C. coli</i>	4.85	SLV367
10	<i>C. coli</i>	6.85	SLV374

PT 36: Quality control

- Vials produced and tested for homogeneity and stability by the Swedish Food Agency or the EURL
- Before selection for the PT, the EURL did enumeration of three vials per batch together with chicken meat to ensure levels and functionality
- The EURL performed the complete test the day after dispatch
- The EURL did additional enumerations on vials with *Campylobacter* to test stability during transport conditions
- Max-min diff 0.63 log₁₀ cfu or lower

Test of stability during transport conditions

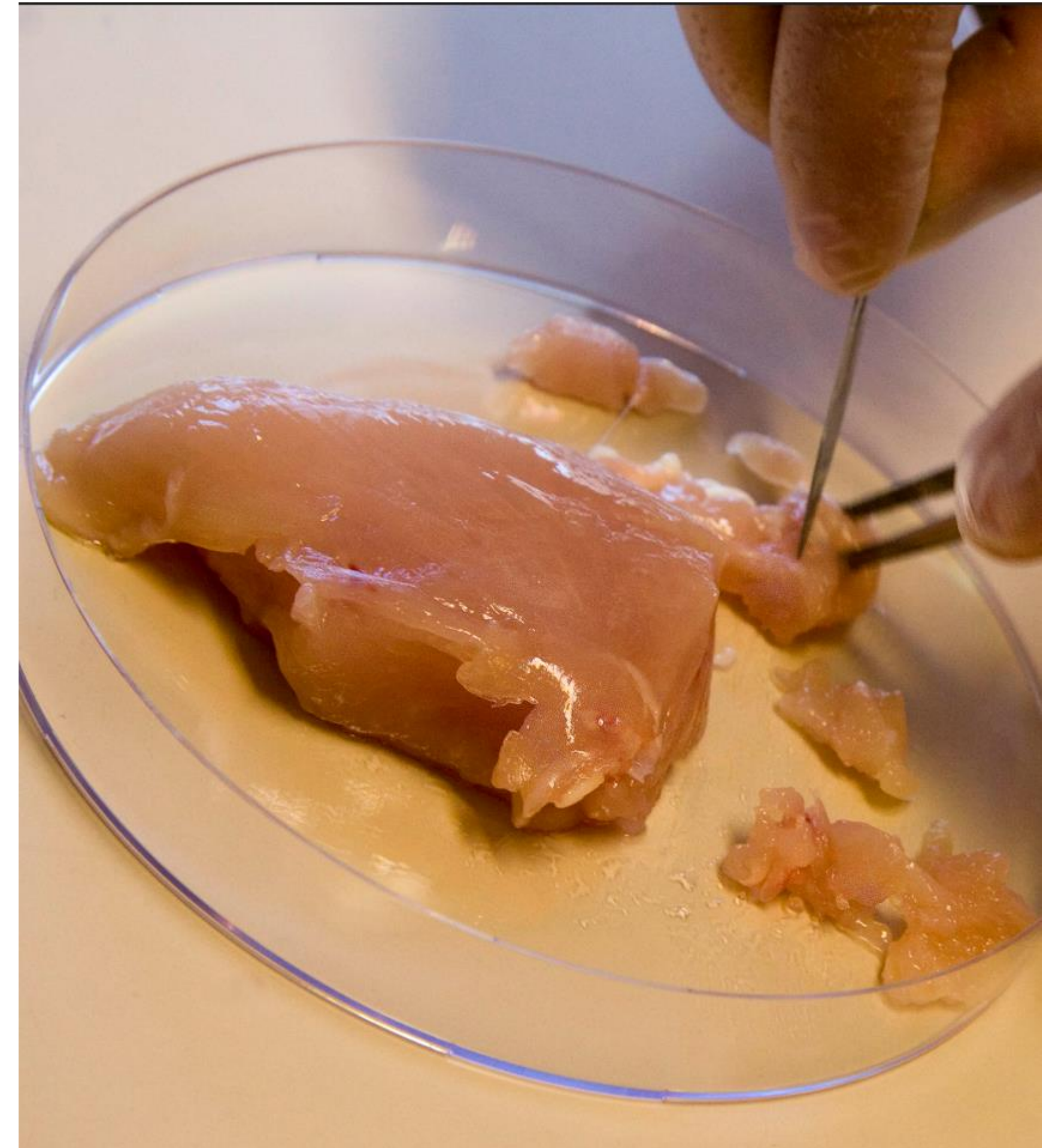
Test occasion	Storage condition	No. of samples tested
Before dispatch	Best case	Each vial with <i>Campylobacter</i> × 2
Two days after dispatch	Best case	The complete test
Two weeks after dispatch	Worst case	Each vial with <i>Campylobacter</i> × 3

Best case: 5 °C for 24 h

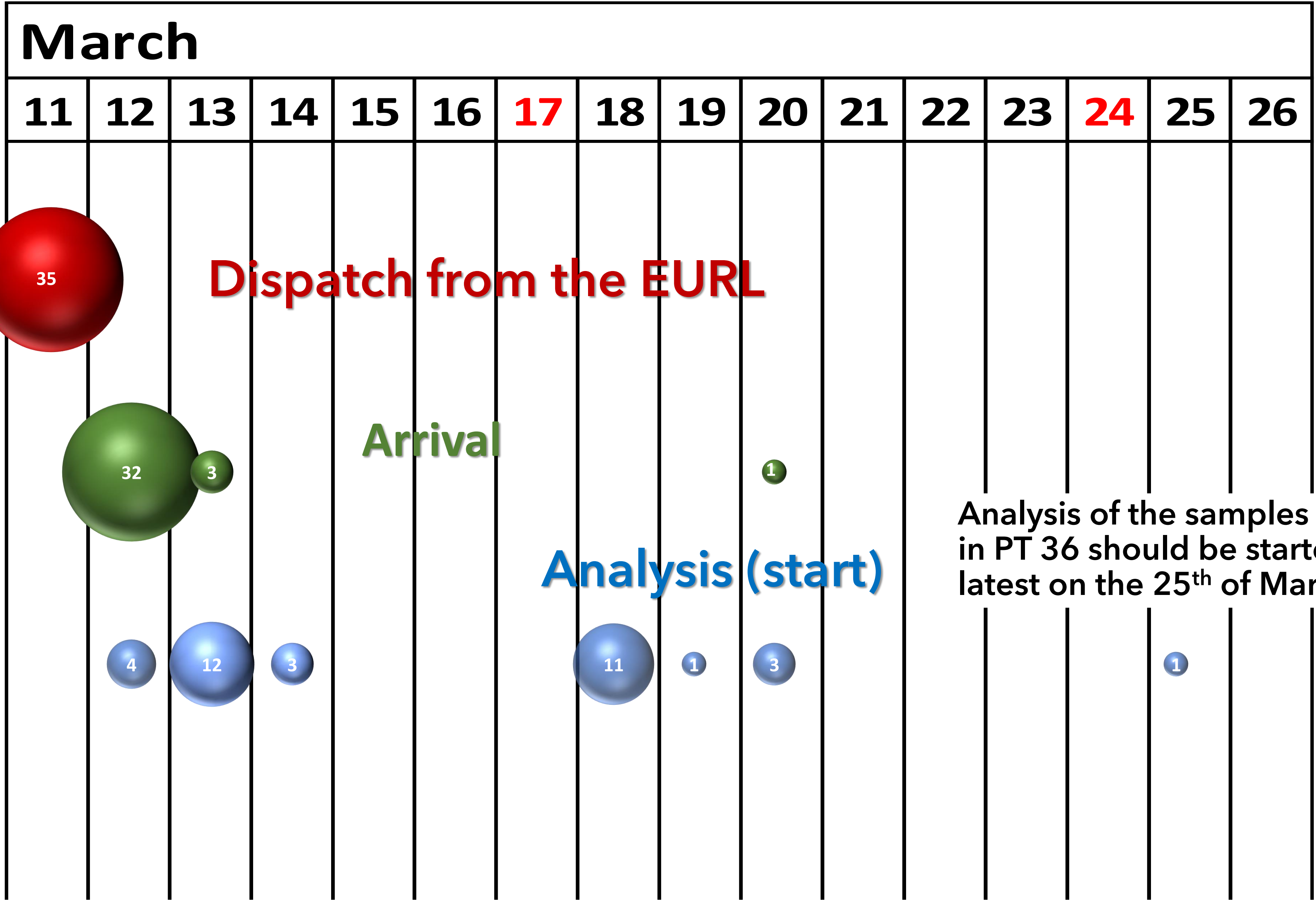
Worst case: 5 °C for 24 h, 15 °C for 24 h, and 5 °C for 24 h

PT 36: Preparation of the chicken meat

- Chicken meat (breast fillets) delivered from a slaughterhouse with low level of *Campylobacter*-positive flocks and a farm with no positive flocks for more than 1 year
- On arrival, tested in triplicate with rinsing water direct streaked on mCCD and Butzler agar
- After freeze-storage for 3 months, tested in triplicate with enrichment in Bolton and Preston broth, as well as direct streak on mCCD and Butzler agar
- All samples tested negative for presence of *Campylobacter* but moderately with background flora was present
- Breast fillets (each about 130 g) separately packed in zip bags
- Stored at $-20\text{ }^{\circ}\text{C}$ until distribution



PT 36: Time to arrival & start of analysis



PT 36: How was performance evaluated?

- The Median Absolute Deviation (MADe) to calculate performance

$$\sigma\text{MADe} = \text{MADe} \times 1.4826$$

- *Campylobacter*-containing samples
 - Results within participants' median $\pm 2 \sigma\text{MADe}$ = 2 points
 - Results between $\pm 2 \sigma\text{MADe}$ and $\pm 3 \sigma\text{MADe}$ = 1 point
 - Results outside $\pm 3 \sigma\text{MADe}$ = 0 points
- *Campylobacter*-negative samples
 - No *Campylobacter* reported = 2 points
 - False positive result = 0 points
- The maximum score (2 points for each sample) was 20 points
- Calculate the score for each participant

Grade	Scoring limits	
Excellent	20	95.1–100%
Good	17–19	85.0–95.0%
Acceptable	14–16	70.0–84.9%
Needs improvement	12–13	57.0–69.9%
Poor	<12	<57.0%

PT 36: How was performance calculated?

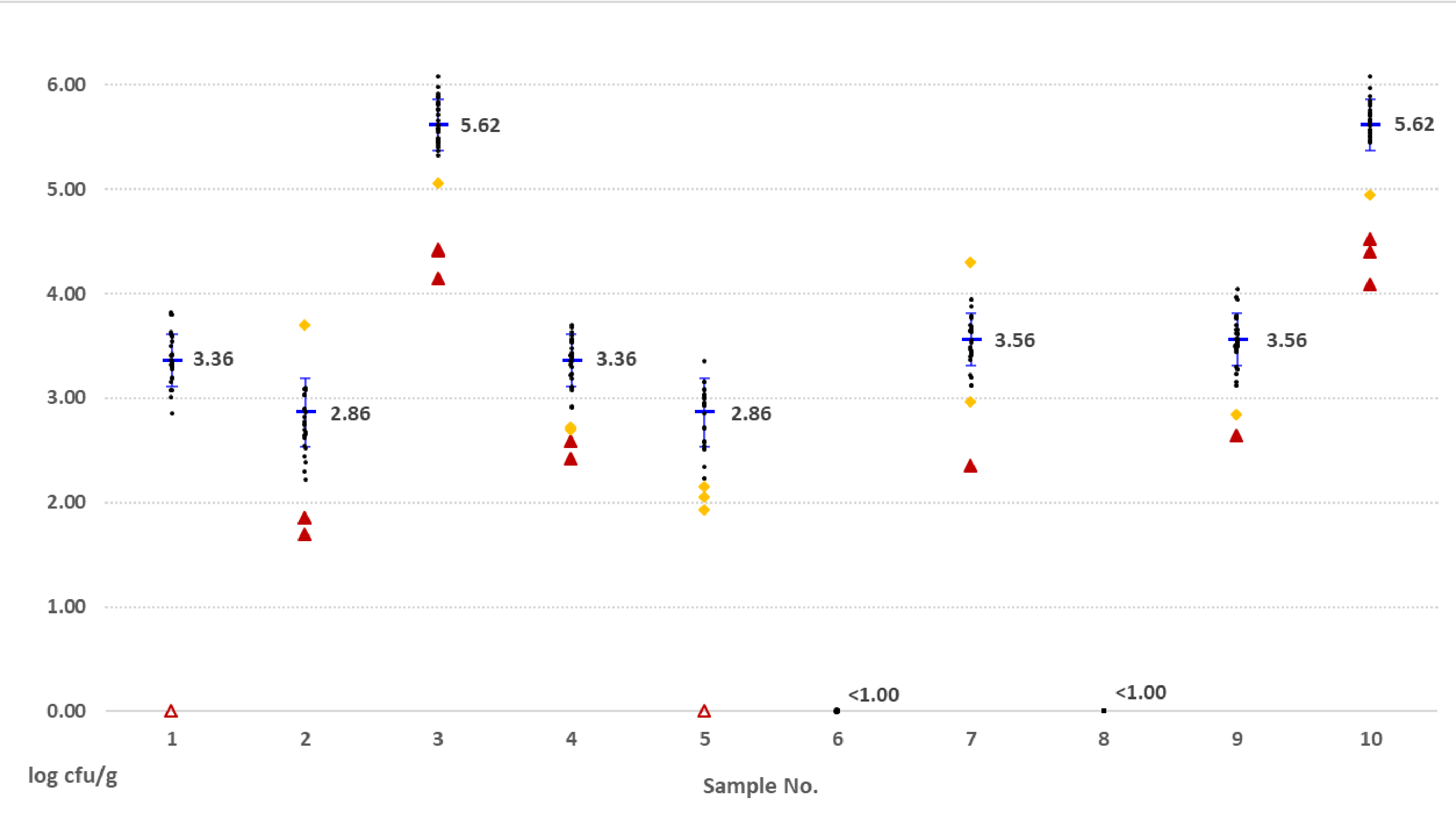
Adaptations because of homogenous results and use of duplicates

- Homogeneous results (3, 7, 9, and 10)
 - σ MADe adjusted to $0.25 \log_{10}$ cfu/g, according to the $0.5 \log_{10}$ rule (ISO 22117:2019)
- Duplicate vials (1 and 4, 2 and 5, 3 and 10, and 7 and 9)
 - Median and σ MADe calculated for 1) each single sample, 2) each pair of samples
 - For performance evaluation: **duplicate** values used
 - ⇒ the same scoring limits for both samples in a pair

No sample in PT 36 had a -3σ MADe limit below $1.0 \log_{10}$ cfu/g

- No adjustment of the minimum score for negative results

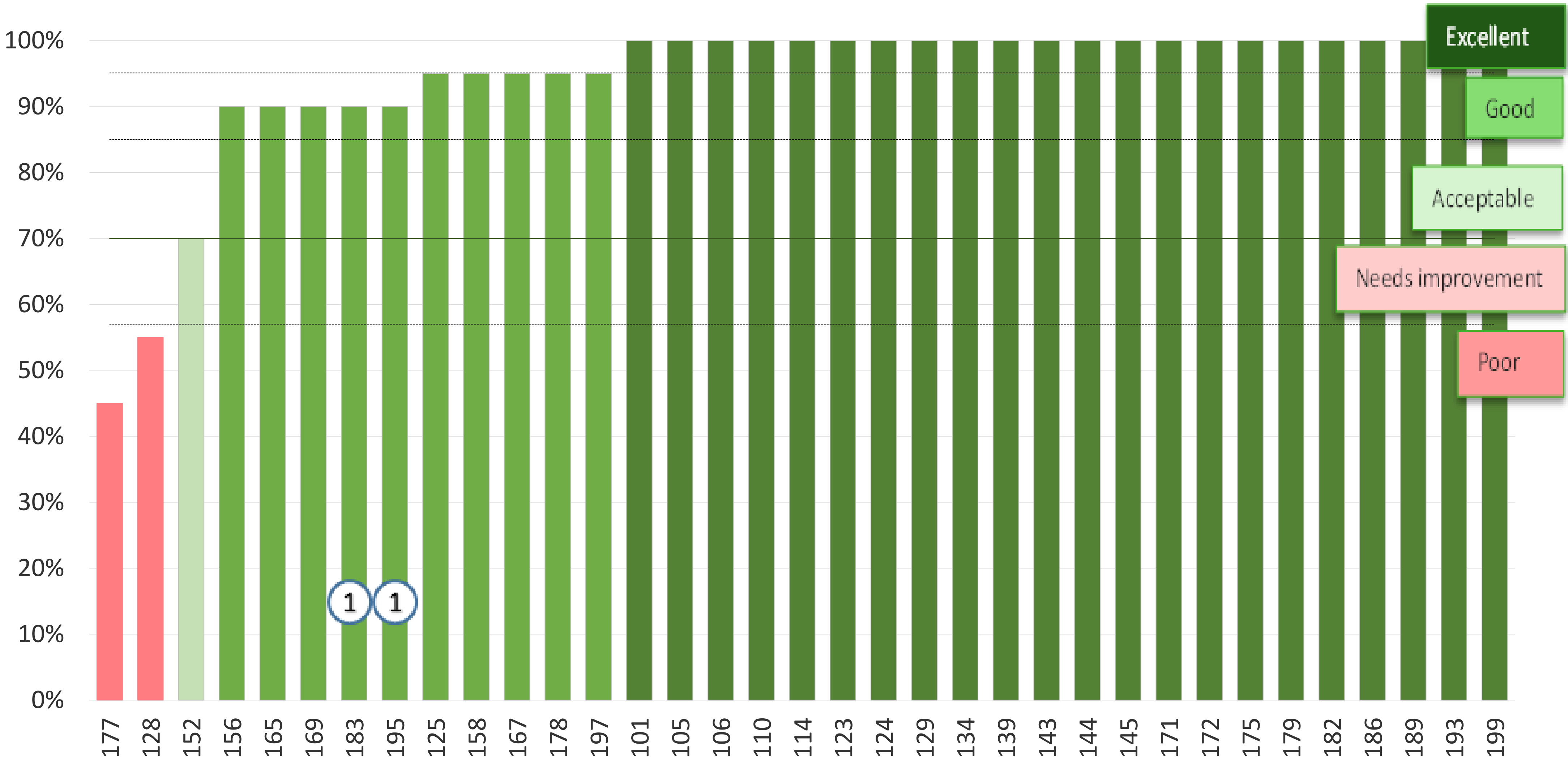
PT 36: Results of enumeration



Variability in PT enumeration results

<i>Year</i>	<i>PT</i>	max-min diff (between labs)				MADe in PT			
		<i>max</i>	<i>min</i>	<i>mean</i>	<i>median</i>	<i>max</i>	<i>min</i>	<i>mean</i>	<i>median</i>
2017	19	5.90	2.19	3.54	3.23	0.37	0.23	0.30	0.29
2018	21	4.06	1.80	3.02	3.31	0.49	0.17	0.30	0.28
2019	23	2.48	1.27	1.88	1.94	0.24	0.19	0.21	0.22
2020	26	3.36	0.92	1.89	1.75	0.32	0.13	0.24	0.24
2021	29	2.65	1.89	2.17	2.08	0.45	0.29	0.37	0.38
2022	31	2.80	0.96	1.86	1.92	0.31	0.11	0.17	0.15
2023	34	3.06	1.42	2.26	2.29	0.23	0.14	0.18	0.18
2024	36	2.00	0.97	1.62	1.94	0.26	0.12	0.17	0.17
	mean	3.29	1.42	2.28	2.31	0.33	0.17	0.24	0.24

PT 36: Performance



Thank you for listening!

