

**SADCMET Water PT evaluation
workshop**

Microbiology Proficiency Testing

1st round

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Topics

- History
- Microbiology PT at the NLGA
- 1st Micro-PT provided by UNBS
- **Evaluation of results**

“History”

- 2004 kick off water chemistry PT also discussions about Microbiology PT
- Invitation by NLGA to come to Germany and have a look at our PT system to consider whether it might be suitable
- 2006 training of 3 persons in Germany
- 2006 workshop with microbiology on the agenda
- 2008 1st round of micro-PT and new group at the workshop

Microbiology PT at NLGA

Parameter	Qualified methods	1986 -1999	2000	2001	2002	2003	2004	2006	2007	2008
<i>E. coli</i> -coliform bacteria	presence/absence test	+	+	+	+	(+)	(+)	(+)	(+)	(+)
	DIN EN ISO 9308-1	(+)	(+)	(+)	(+)	+	+	+	+	+
	Colilert®-18/Quanti-Tray®					+	+	+	+	+
Colony Count	German DWD 1990	+	+	+	+	+	+	+	+	+
	DIN EN ISO 6222			+	+	+	+	+	+	+
<i>Enterococci</i>	EN ISO 7899-2		(+)	(+)	+	+	+	+	+	+
	Chromocult®-Enterococci-Agar							+	+	+
<i>Clostridium perfringens</i>	DWD (mCP-Agar)			(+)	+	+	+	+	+	+
	TSC			(+)	+	+	+	+	+	+
<i>Pseudomonas aeruginosa</i>	EN 12780/ISO 16266				+	+	+	+	+	+
<i>Legionella spec.</i>	GVPC (ISO 11731-2)					+	+	+	+	+
EC bathing water directive										
Feacal coliform bacteria				+	+	+	+	+	+	(+)
<i>E. coli</i> -coliform bacteria	DIN EN ISO 9803-3							(+)	+	+
Intestinal Enterococci	DIN EN ISO 7899-2							(+)	+	+
	DIN EN ISO 7899-1							(+)	+	+

PT samples - two options

Liquid samples	Freeze dried material
Bacterial solution in defined mineral medium	Bacteria adsorbed to matrix e.g. milk powder
Very realistic samples Handling exactly like a real sample	A solution has to be prepared and first step of handling procedure is different from real samples
Stability 4-6 days after shipment at $<10^{\circ}\text{C}$	Stability weeks or months after shipment at -20°C
Germany	United Kingdom, France, Sweden...(Botswana, SA)

Preparation at NLGA



Shipping

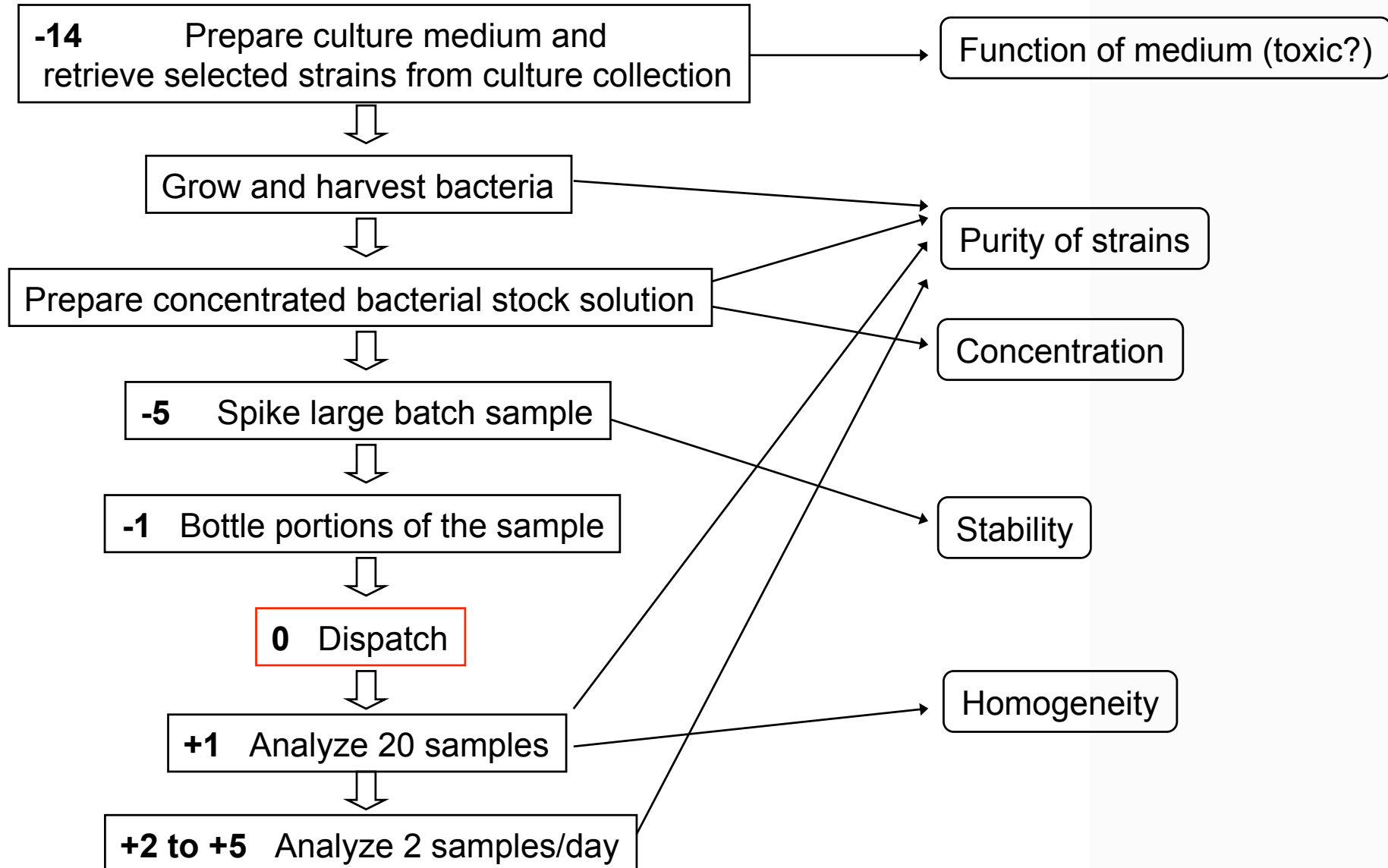


300 - 500
participants/PT

Registered:

> 700 Labs from
Germany
Austria (26)
Switzerland (8)
Lithuania (2)
Hungary (2)
Great Britain (1)
Luxembourg (1)

Schedule of a PT (provider)

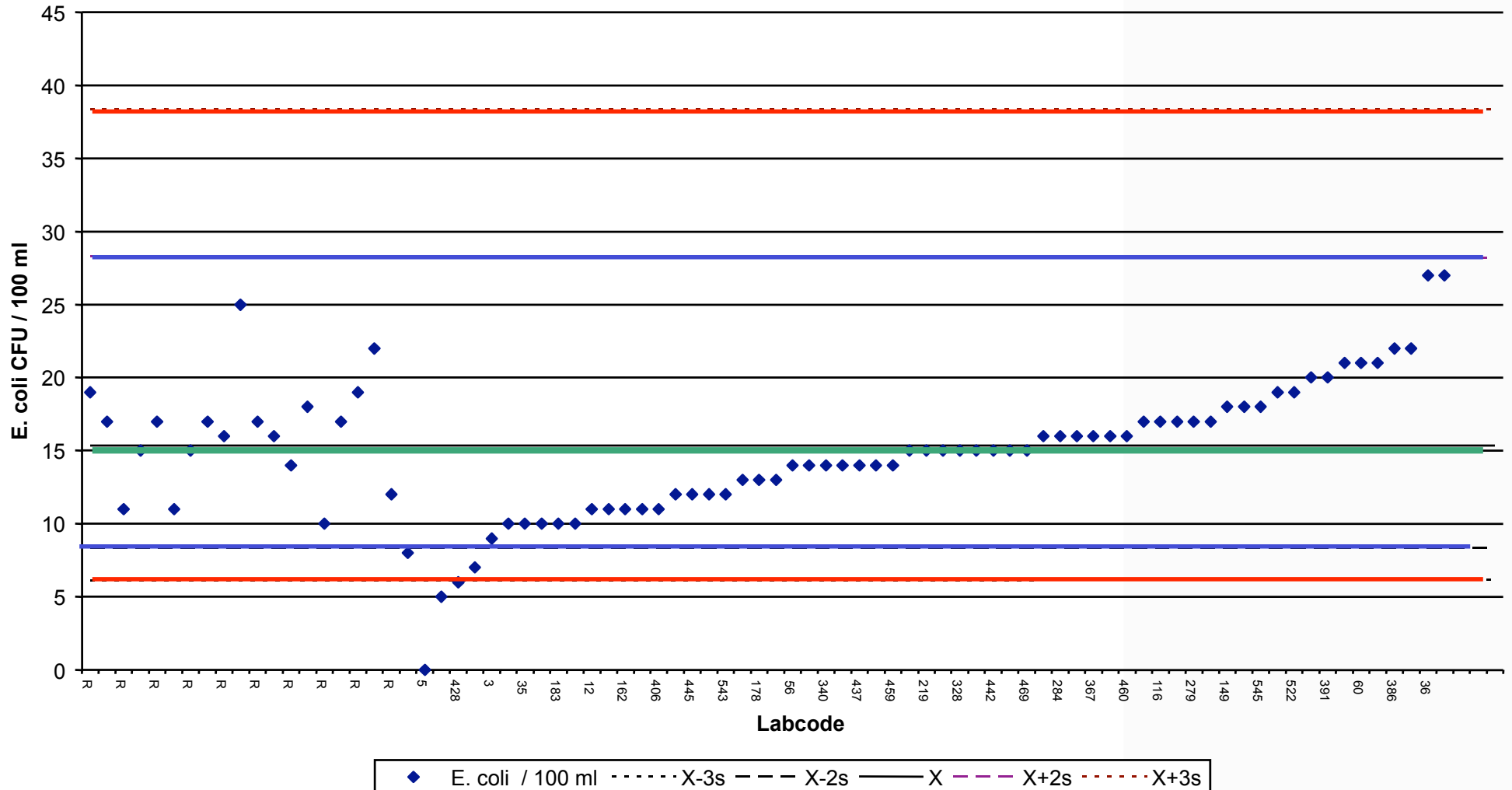


Schedule of a PT (provider)

- Collect the reported data
- Evaluate the data
- Write a report and distribute it
- Provide any necessary and interesting information to participants

E. coli

PT 1-2003

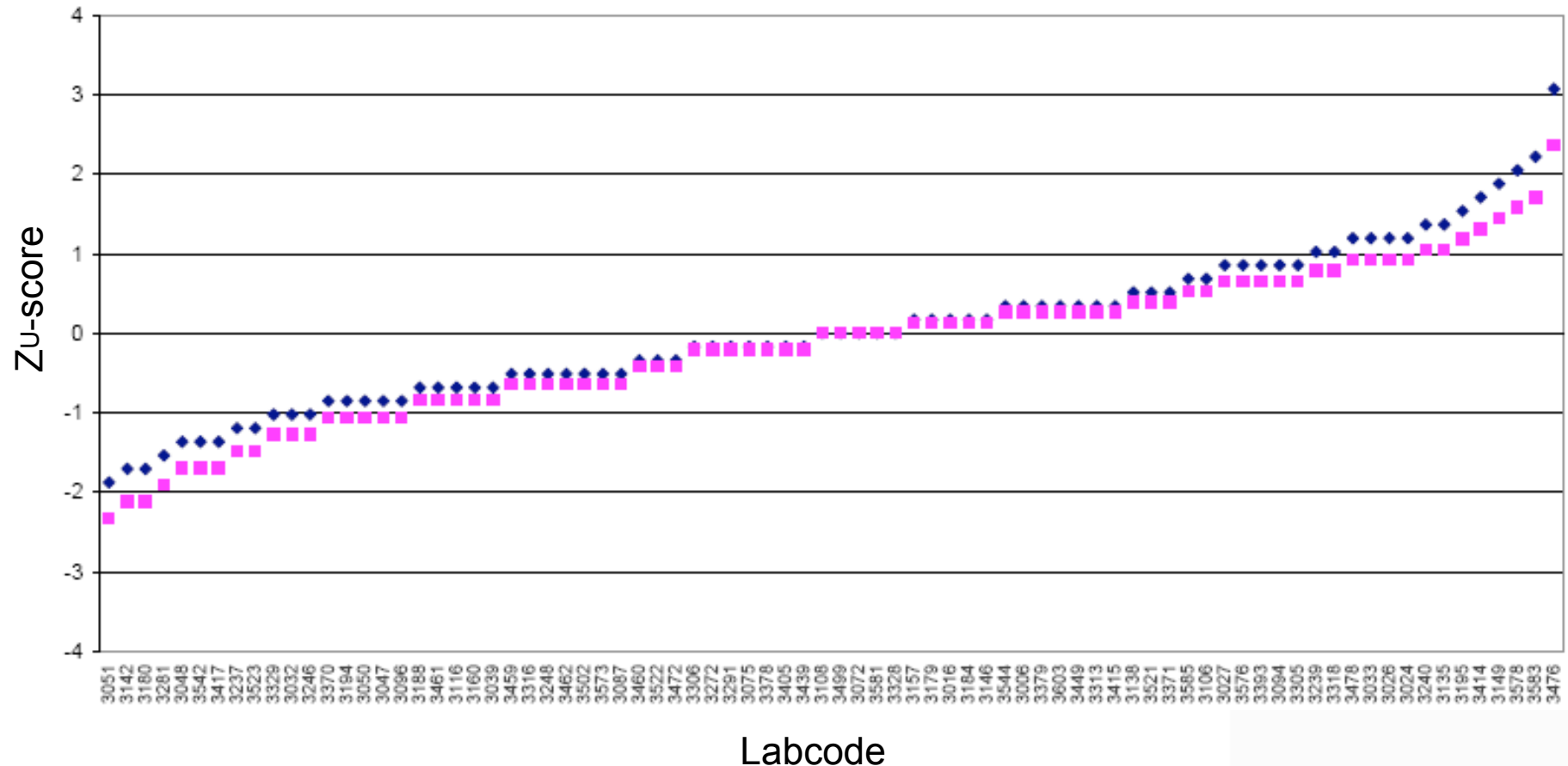


Evaluation

- Standards for chemistry may be applied if:
 - Parameter analyzed can be considered continuously measureable
 - true for most chemical and physico-chemical parameters
 - not always true for biological and/or microbiological parameters
- Application in Chemistry: **Yes**
- Application in microbiology: **by way of trial** / mostly

Microbiology PT

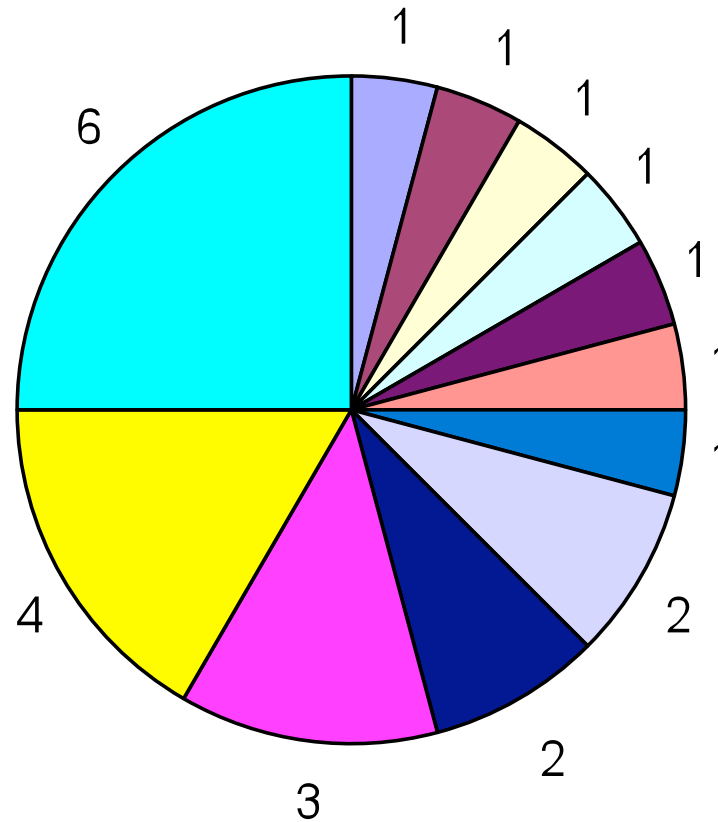
Group B III-2008 *E. coli* (target value of 21 CFU/100 ml)



Time schedule UNBS

Preparation stock solution	Oct. 4 th
Determination of concentration	Oct. 4 th -8 th
Bottling	Oct. 9 th
Shipment	Oct. 10 th
Stability testing	Oct. 10 th -19 th
Reporting deadline	Oct. 26 th
Workshop	December 10 th -12 th
Evaluation Report	in preparation

Participation



- Botswana
- Ethiopia
- Madagascar
- Mauritius
- Rwanda
- Swaziland
- Zambia
- Malawi
- Tanzania
- Uganda
- Namibia
- Kenya



Samples

Parameters: *E. coli*/coliform bacteria (*E. coli* NC09001)

Total plate count (*E. coli* NC09001)

Consistent with what was decided in Gaborone 2006.

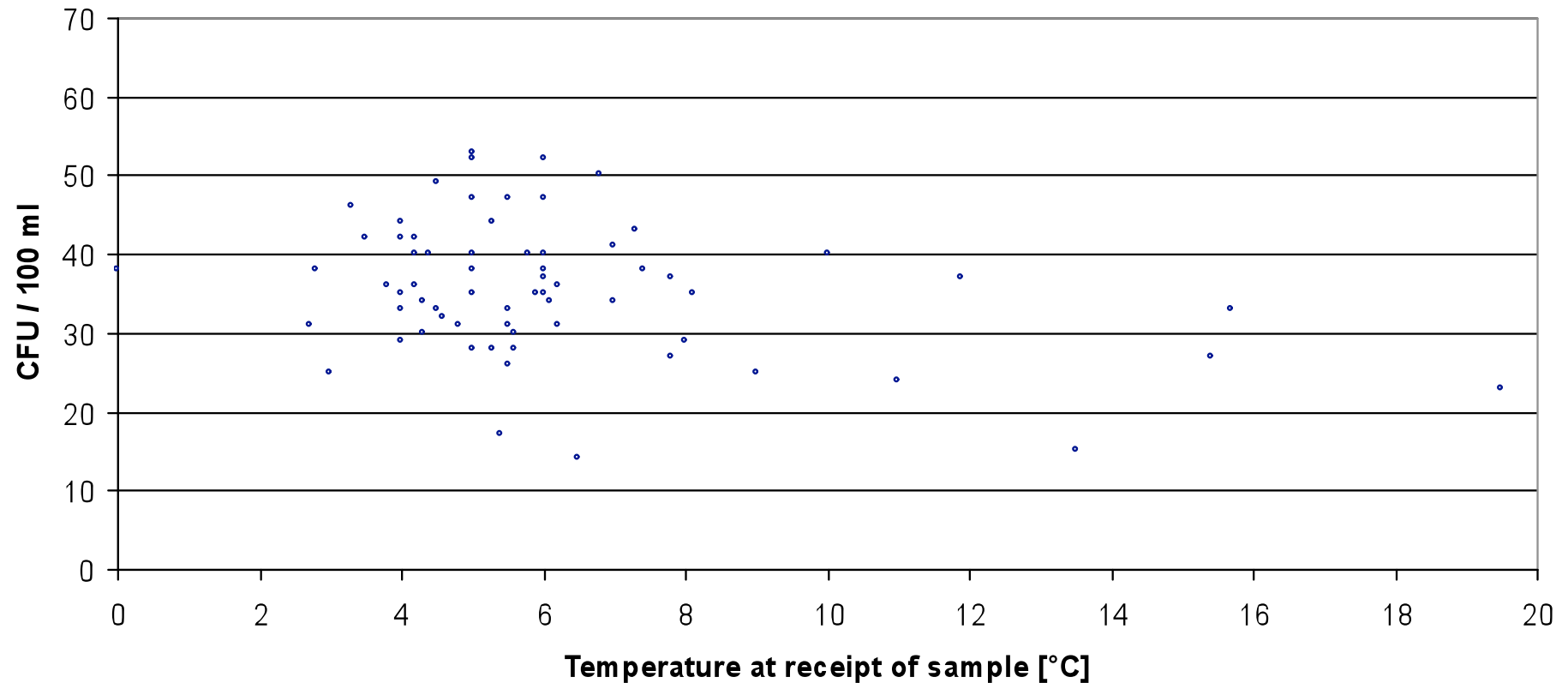
- **drinking water (tap water)**
- *borehole water*
- **mineral water**
- *recreational water*
- waste water
- **reclaimed water**
- **bottled water**
- *surface water*

Distribution

- Packaging was prepared similar to that of the NLGA
- Courier of the UNBS was used: Sky Net
- Date of shipment: 10th October

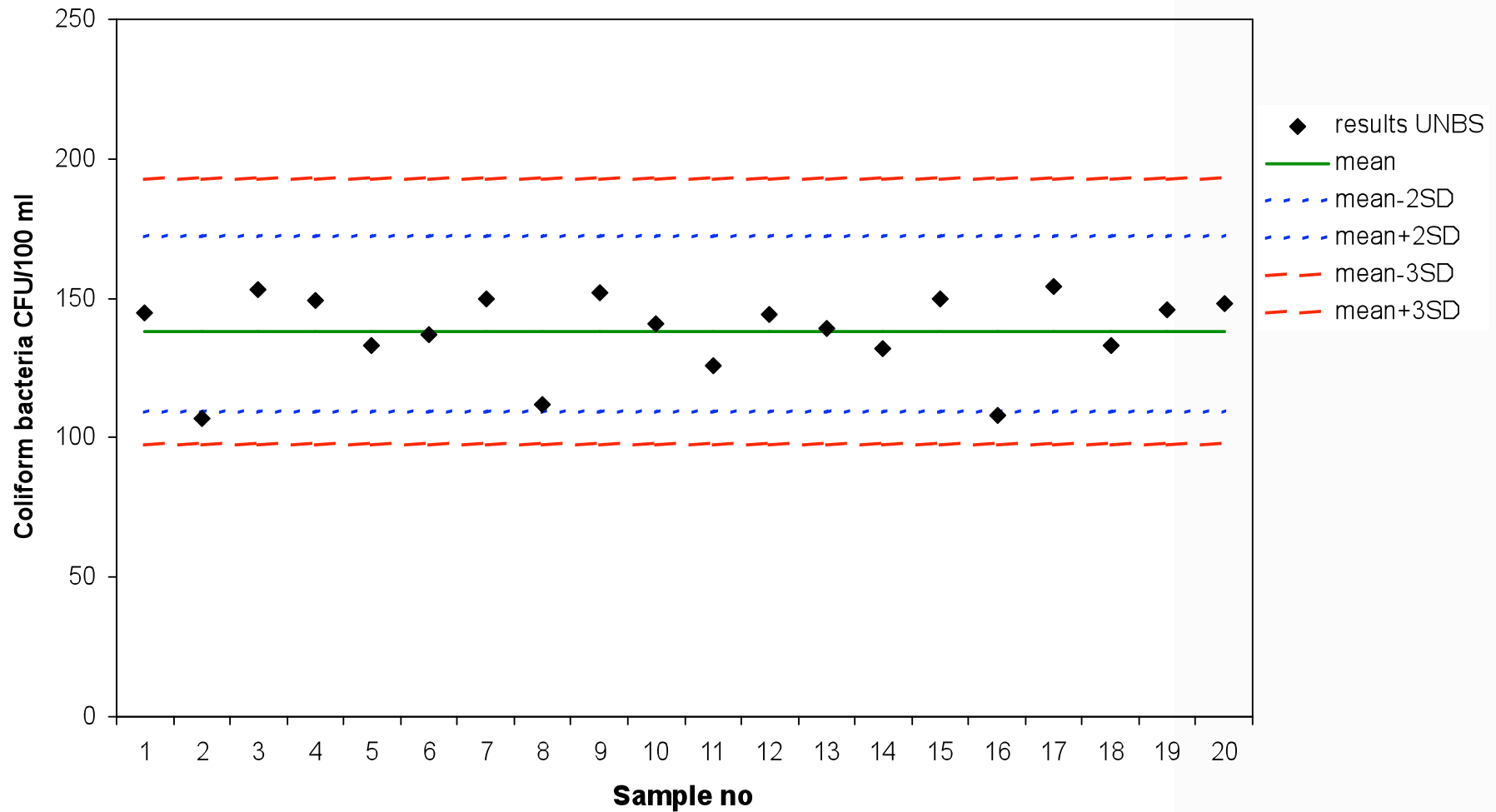
- We need the exact date of arrival of the samples at every Laboratory as time is crucial for the stability of this type of sample.

Influence of Temperature on Result



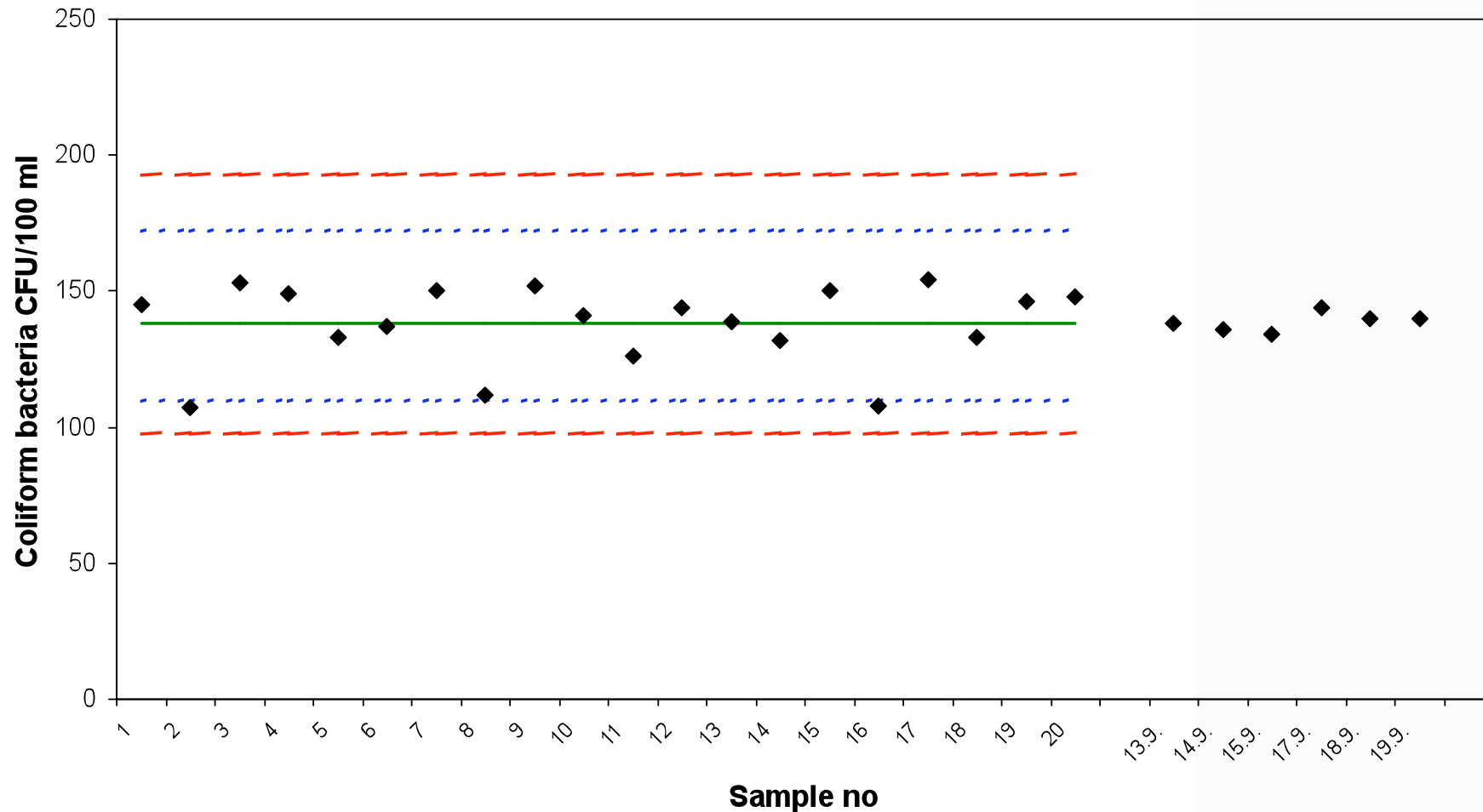
Distribution

Homogeneity of the sample is satisfactory



Stability

Stability of the sample is satisfactory (up to 10 days after bottling) under chilled conditions



Results sample A (Coliforms)

LabID	CFU/100ml	LabID	CFU/100ml
1	22.000.000	3	0
2	106	14	17
3	0	2	106
4	22.500	20	210
7	276	7	276
9	>300	23	450
10	3.000	16	1.150
11	1.600	11	1.600
12	1.425.000	10	3.000
13	3.000	13	3.000
14	17	21	18.000
16	1.150	4	22.500
17	>300	18	46.000
18	46.000	12	1.425.000
20	210	1	22.000.000
21	18.000	22	>150
22	>150	9	>300
23	450	17	>300

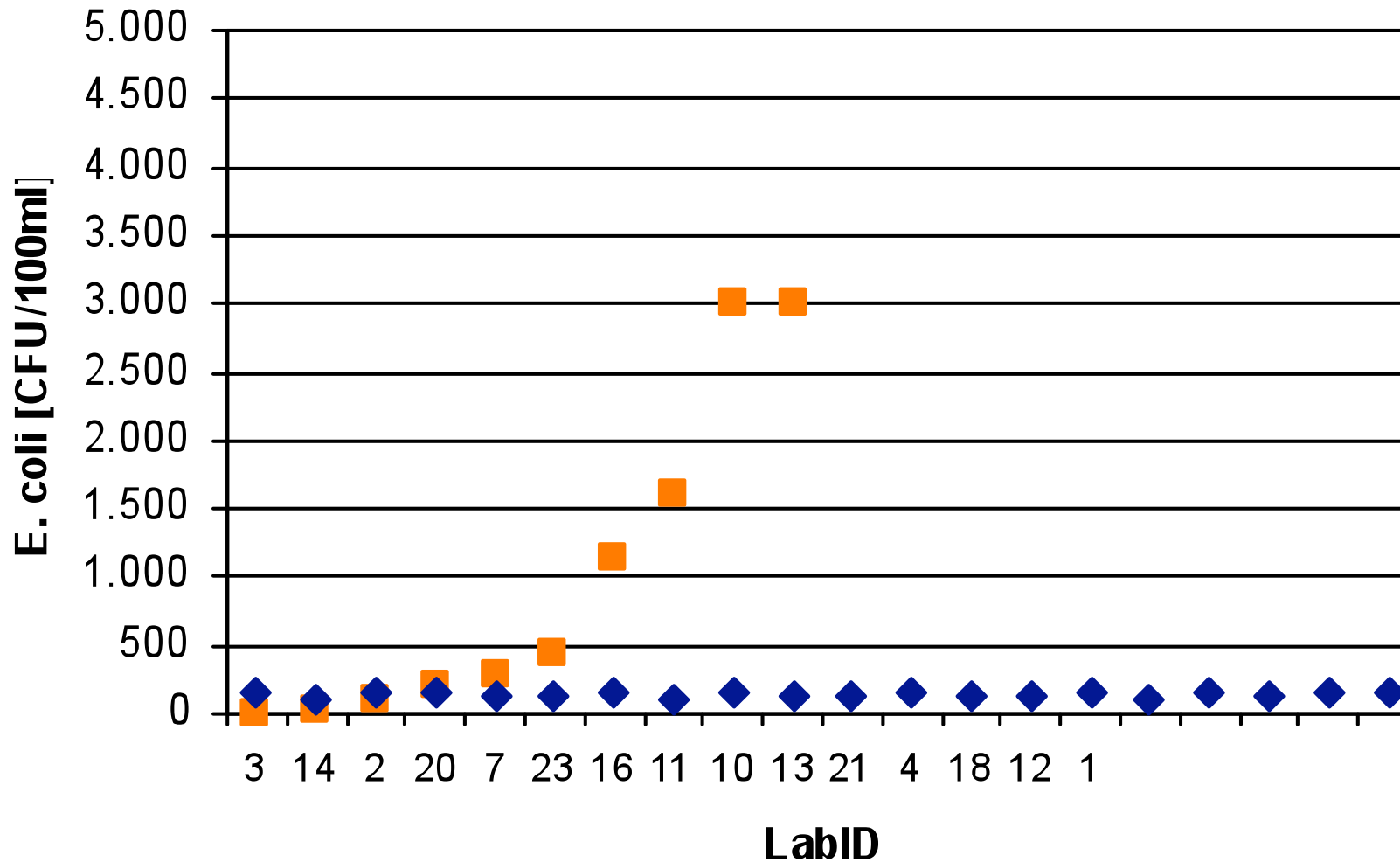
No statistical analysis done because of the wide range of the results

Possible causes:

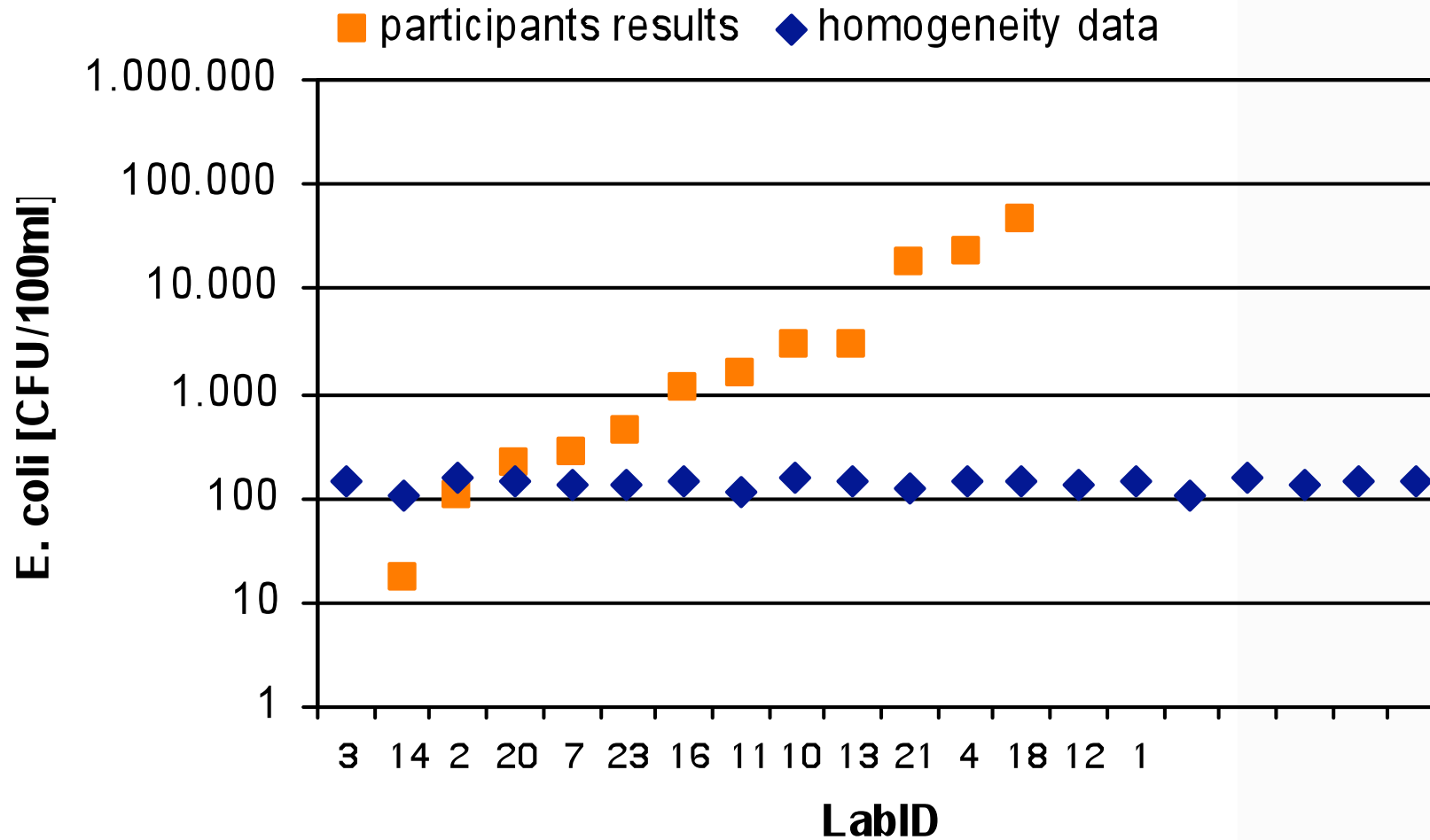
a) growth of the used strain prior to analysis

b) bad Lab-performance

Results sample A (Coliforms)



Results sample A (Coliforms)



Evaluation Sample A

Preparation of the sample was good.

Homogeneity and stability tests showed the wanted characteristics.

No statistical analysis possible because of the wide range of the results

Possible causes:

- a) growth of the used strain prior to analysis**
- b) bad Lab-performance

Evaluation Sample A

All but one laboratory did find coliform bacteria indicating that the strain is pretty stable at higher temperatures.

Methods stated in the report sheet and the reported result were not always consistent.

TPC (sample B)

Sample contained the same strain and was spiked from the identical stock solution into the same medium as sample A.

Homogeneity and stability tests had very low counts due to the use of dilutions used.

Characteristics may be assumed to be similar to sample A.

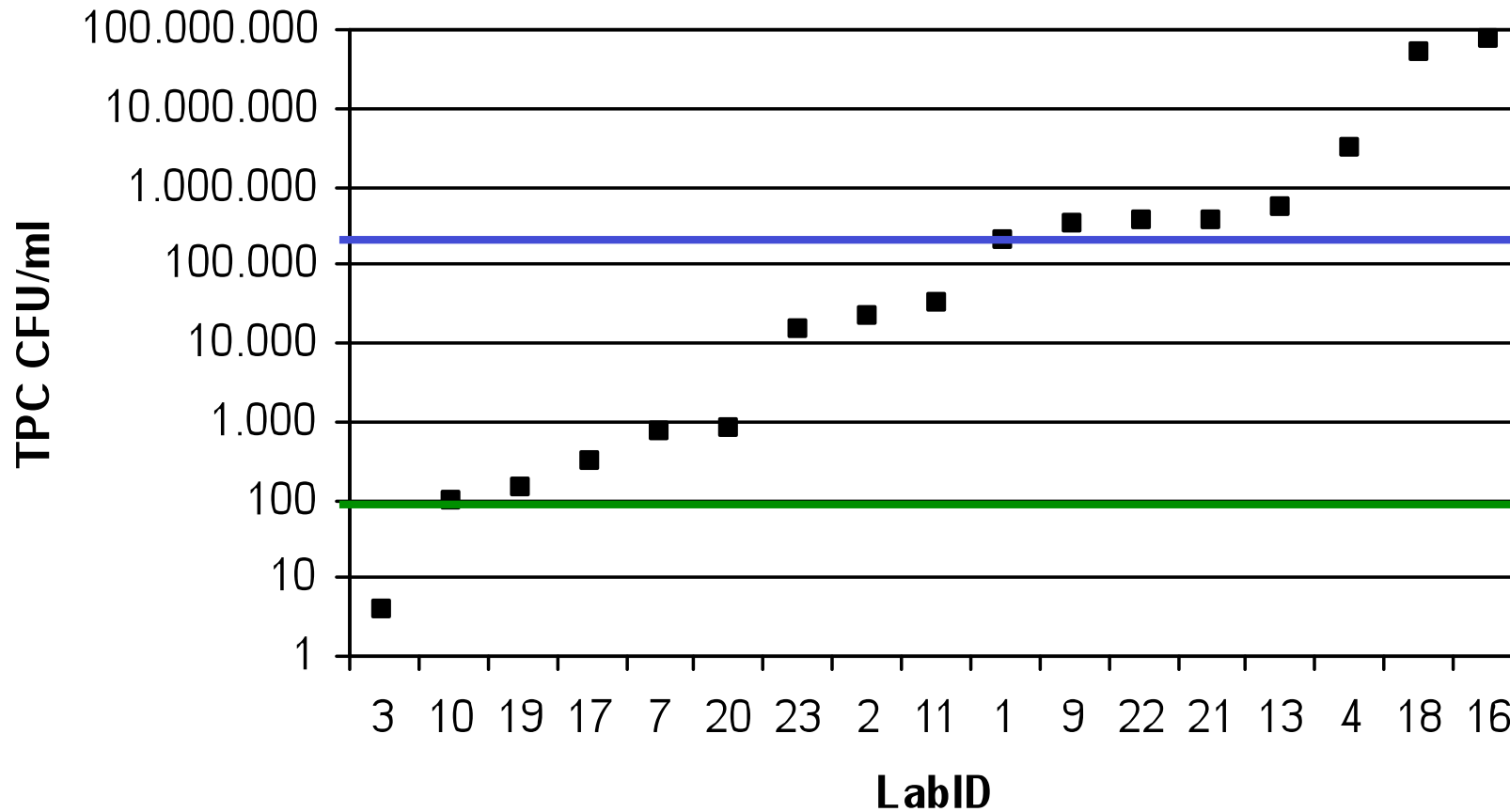
Concentration of *E. coli* in the sample was most probably approximately 100 CFU/ml.

TPC (sample B)

LabID	CFU/ml
1	210.000
2	21.700
3	4
4	2.950.000
7	706
9	323.000
10	100
11	31.000
13	550.000
16	78.000.000
17	>300
18	52.000.000
19	135
20	842
21	370.000
22	350.000
23	15.000

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3	4
10	100
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23	15.000
2	21.700
11	31.000
1	210.000
9	323.000
22	350.000
21	370.000
13	550.000
4	2.950.000
18	52.000.000
16	78.000.000
17	>300

TPC results (sample B)



Evaluation Sample B

Preparation of the sample can be assumed to have been satisfactory.

No statistical analysis possible because of the wide range of the results

Possible causes:

- a) growth of the used strain prior to analysis**
- b) bad Lab-performance

Problems encountered

Packaging only held the temperature for 24 hours.

Homogeneity and stability tests had very low counts due to the use of dilutions used.

Reporting sheet did not ask to report separately for E. coli and coliform bacteria.

Reporting sheet did not ask for the date of receipt of the sample.