



Proficiency Test Report

Final Report

Food Microbiology Scheme

FM2 Enumeration of (*Staph aureus*) in Rice.

FM2 Detection of Pathogenic *Vibrio* spp in Fish

FM2 Detection of *Salmonella* spp in Fish & Chicken

July 2022

Issue date: **July 2022**

Participant: **Central Lab for marine fish diagnosis & treatment & measuring fish and water quality.**

Lab No. **11**

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ALL data and results related to this report considered confidential

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Report summary:

Proficiency test (PT) report for the PT scheme conducted in July 2022 for FM2 Enumeration of (*Staph aureus*) in Rice, Detection of Pathogenic *Vibrio* spp in Fish, Detection of *Salmonella* spp in Fish & Chicken, aims to provide an independent assessment of the competence of participating laboratories. Together with the use of validated methods, proficiency testing is an essential element of ensuring validity of results according to ISO/IEC 17025:2017.

13 labs participate in the scheme and they receive 13 test materials to be analyzed as routine sample analysis in July 2022.

The whole scheme is according to ISO 17043:2010 and for statistical analysis according to ISO 13528:2015.

Test Materials:

All test items has been tested to be sure that it is free from the targeted pathogen before preparation of the sample.

The item to be tested (rice) has been used for enumeration of *Staph aureus* collected from commercial supplier then spiked (fortified) with traceable strain of *Staphylococcus aureus* ATCC 25923 taking in consideration the environmental conditions (18-27 ° C) for this kind of test during preparation, also samples were surrounded with ice bags during transportation to keep temperature around 5 ± 3 ° C, it was tested for staph aureus and it was free before

The item to be tested (Chicken) has been used for S1 for *Salmonella* spp detection collected from commercial supplier then spiked (fortified) with traceable strain of *Salmonella* typhimurium ATCC 14028 taking in consideration the environmental conditions (18-27 ° C) for this kind of test during preparation, also samples were surrounded with ice bags during transportation to keep temperature around 5 ± 3 ° C.

The item to be tested (Fish) has been used for S2 for *Salmonella* spp detection collected from commercial supplier then spiked (fortified) with traceable strain of *Salmonella* typhimurium ATCC 14028 taking in consideration the environmental conditions (18-27 ° C) for this kind of test during preparation, also samples were surrounded with ice bags during transportation to keep temperature around 5 ± 3 ° C.

The item to be tested (Fish) has been used for *Vibrio* spp detection collected from commercial supplier taking in consideration the environmental conditions (18-27 ° C) for this kind of test during preparation, also samples were surrounded with ice bags during transportation to keep temperature around 5 ± 3 ° C.

Subcontracted activities:

All subcontracted activities were performed in a competent lab according to ISO/IEC 17025:2017.

- ✓ Testing the materials before the preparation,
- ✓ Homogeneity
- ✓ Stability.

Homogeneity and stability studies:

For *Staph aureus* enumeration:

Randomly selected 8 samples have been analyzed in duplicate, with interval then the results used for homogeneity and stability.

Samples were prepared using calibrated equipment and tested after being labeled and packed.

These data showed sufficient homogeneity and stability and were not included in the subsequent calculation of the assigned values.

Overall Average	4.54
SD of averages	0.10
S w	0.04
S s	0.1
σ_{PT}	0.19
Check Value	0.06
\sqrt{C}	0.14
Homogeneity	OK
 y1 -y2 	0.02
Stability	OK

For *Salmonella* spp detection:

Randomly selected 10 samples have been analyzed in duplicate, with interval then the results used for homogeneity and stability.

These data showed sufficient homogeneity and stability.

S1 D1	S1 D2	S2 D1	S2 D2
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected
Detected	Detected	Detected	Detected

For Pathogenic *Vibrio* spp detection:

Randomly selected 10 samples have been analyzed in duplicate, with interval then the results used for homogeneity and stability.

S1 D1	S1 D2
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected
Not Detected	Not Detected

Labelling and dispatch:

All samples were labelled in GENINE facility prior to dispatch and every samples accompanied with FM1 F-Q-28 PT instructions form and Round 2 F-Q-29 PT results submission.

The packaging and method of transport of the samples are considered carefully to ensure that they are adequate and able to protect the stability and characteristics of the samples, all samples were surrounded by ice bags during transportation to ensure samples were preserved at 5±3 °c during transportation.

All of the samples were dispatched in the 1st 10 days of July 2022.

Results and performance evaluation

Table 1 *Staph aureus* results compared to assigned value X = 4.48 Log 10 ± 0.06; and (σ PT) = 0.19

Lab no.	Labs results in CFU/g	Results as Log ₁₀	Z-Score	Evaluation
1	41200	4.61	0.7	Satisfactory
2	30000	4.48	0.0	Satisfactory
3	30000	4.48	0.0	Satisfactory
4	25000	4.40	-0.4	Satisfactory
5	50000	4.70	1.2	Satisfactory
6	26000	4.41	-0.3	Satisfactory
7	23000	4.36	-0.6	Satisfactory
8	20000	4.30	-0.9	Satisfactory
9	44000	4.64	0.9	Satisfactory
10	56000	4.75	1.4	Satisfactory

Fig 1 Results compared to the assigned value XPT for *Staph aureus*

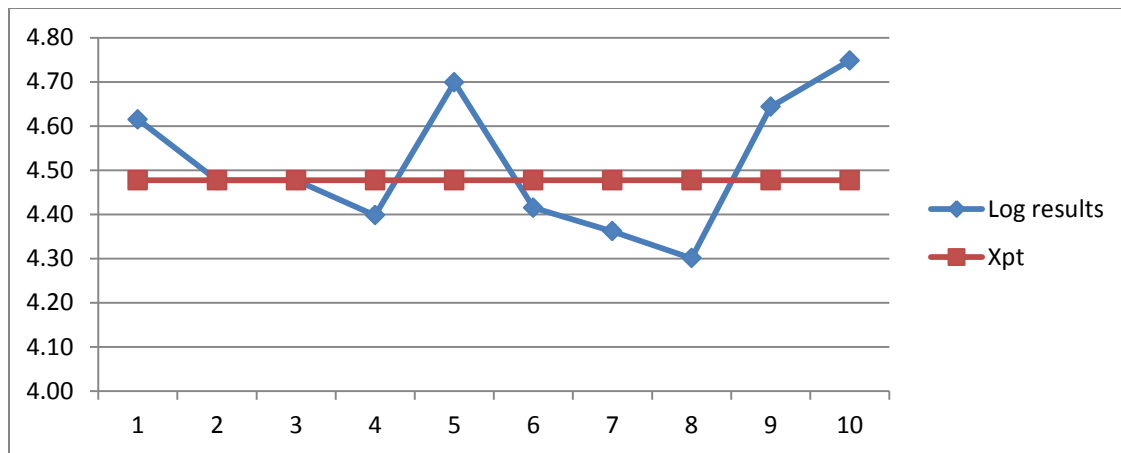


Fig 2 Z-score for *Staph aureus* (Series represented as lab number).

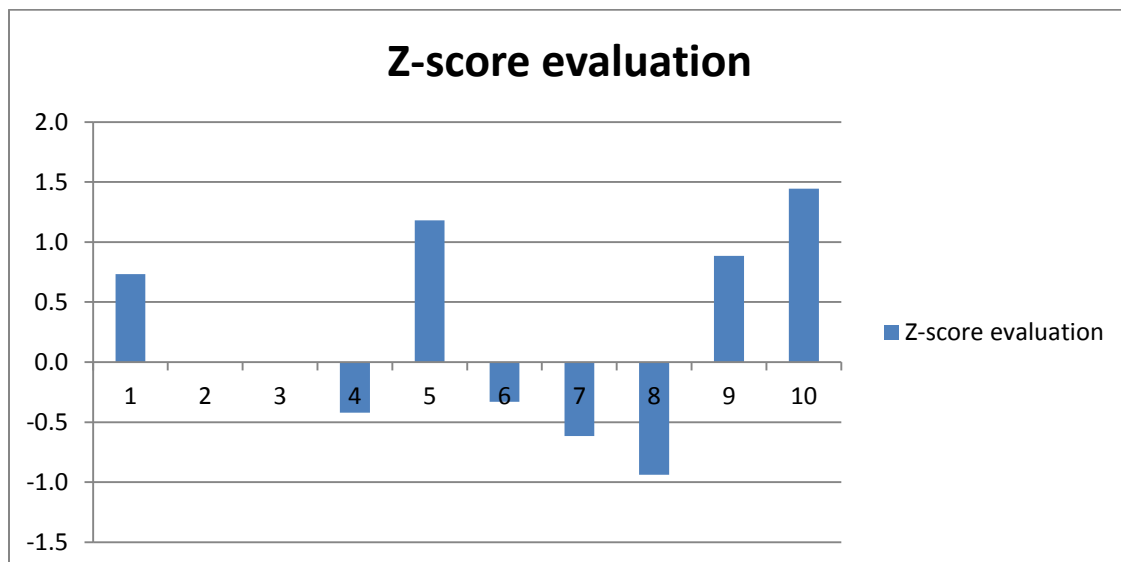


Table 2 *Salmonella* spp detection results as detected or not detected/25g:

Assigned values were S1 in chicken is Detected /25 g and S2 in Fish is Detected in 25/g

Lab no.	Labs results for S1	Labs results for S2	Evaluation
1	Detected	Detected	Satisfactory
2	Detected	Detected	Satisfactory
3	Detected	Detected	Satisfactory
4	Detected	Detected	Satisfactory
5	Detected	Detected	Satisfactory
11	Detected	Detected	Satisfactory
12	Detected	Detected	Satisfactory
13	Detected	Detected	Satisfactory

Table 3 Pathogenic *Vibrio* spp detection in fish results as detected or not detected/ 25g:

Assigned values was Not Detected in 25/g

Lab no.	Labs results	Evaluation
6	Not Detected	Satisfactory
7	Not Detected	Satisfactory
8	Not Detected	Satisfactory
9	Not Detected	Satisfactory
10	Not Detected	Satisfactory
11	Not Detected	Satisfactory

Evaluation of the results

The labs send back the results as 1 result for the PT sample results

Participants' z -scores and it was calculated as:

$$Z = (X - X_a) / \sigma \text{ PT}$$

- X is the participant's reported result
- X_a is the assigned value
- σ is the standard deviation for proficiency

Z-score criteria:

- $|Z| \leq 2$ Acceptable
- $2 < |Z| \leq 3$ Questionable
- $3 < |Z|$ unacceptable

Statistical data

Assigned value calculations:

Value attributed to be true value of FM2 PT-scheme.

Assigned Value has been calculated from participant results (as Median) and will be expressed as Log 10, no outliers were found for all tests.

All results were included in the calculation of the assigned value.

PT Standard deviation:

The standard deviation for proficiency, σ PT calculated from robust standard deviation.

Interpretation of participant results

- ❖ 13 participants send results using official methods:
 - ✓ ISO 6888-1:1999/Amd: 2018 (labs: 1-10) for *Staph aureus*.
 - ✓ ISO 6579-1:2017/Amd: 2020 (Labs: 1-5 and 11-13) for *Salmonella* spp.
 - ✓ ISO 21872-1:2017 (Labs: 6-11) for pathogenic *Vibrio* spp.
- ❖ All labs send results within the closing date.
- ❖ All results are satisfactory for **Staph aureus** enumeration (No questionable and No unsatisfactory).
- ❖ All results are satisfactory for **Salmonella spp** detection (No questionable and No unsatisfactory).
- ❖ All results are satisfactory for **Vibrio spp** detection (No questionable and No unsatisfactory).
- ❖ All participants are accredited or competent for ISO 17025:2017 to complete the metrological traceability.

References

- 1- Baumeister: Homogeneity of EQA samples, EQALM Symposium 2013, Bucharest.
- 2- The international harmonized protocol for the proficiency testing of analytical chemistry laboratories, IUPAC Protocol.
- 3- ISO/IEC 17043:2010, Conformity assessment — General requirements for proficiency testing.
- 4- ISO 13528:2015, Statistical methods for use in proficiency testing by interlaboratory comparison.
- 5- QP-Q-06 GENUINE-PT Protocol.

End of the report.