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Paper: “Physicochemical and Microbiological Assessment of Fresh and Frozen Fish Marketed in the Coastal Area of Togo”

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Corresponding Author: Sefako Mireille Agonsa

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Peer review:

Reviewer 1: Dritan Topi
University of Tirana, Albania

Reviewer 2: Steven Thomas Tumaini
College of Business and Education, Tanzania

Reviewer 3: Justine Kibet Rutto
Kenya Marine and Fisheries Research Institute

Reviewer A:

Recommendation: Resubmit for Review

The TITLE is clear and it is adequate to the content of the article.

The title is generally clear and reflects the overall content of the manuscript. It adequately captures the main focus of the study, namely the quality assessment of fresh and frozen fish marketed in the coastal area of Togo. However, the title could be slightly more precise by indicating that the study integrates physicochemical and microbiological quality assessments. My proposal of title is : Physicochemical and microbiological assessment of fresh and frozen fish marketed in coastal Togo.

The ABSTRACT clearly presents objectives, methods, results, and conclusions.

The abstract presents the major components of the study, including objectives, methodology, main findings, and conclusions. However, several issues need improvement. The description of the sampling design remains unclear, particularly regarding the rationale for the selection of 42 stakeholders and the formation of 22 composite samples. The abstract would benefit from greater methodological clarity and more cautious interpretation.

There are a few grammatical errors and spelling mistakes in this article.

The overall language quality of the manuscript is generally acceptable and the article is understandable throughout. I did not identify major grammatical or spelling issues that would significantly affect comprehension. However, a few minor language inconsistencies remain. For example, the expression “there are no any conflict of interests” is grammatically incorrect and should be revised to “there is no conflict of interest” or “the authors declare no conflict of interest.” Overall, only minor language polishing is recommended prior to publication.

The study METHODS are explained clearly.

The methodological framework is generally understandable, but several important aspects require clarification. The rationale behind the selection of 42 local stakeholders is not explained, and the representativeness of this sample size remains uncertain. The use of composite samples substantially reduces biological variability and raises concerns regarding statistical independence. In addition, the criteria used to select collection sites and the reason for combining multiple fish into composite samples should be better justified. The methods section would also benefit from clearer separation between study area description and sampling procedures.

The results are clear and do not contain errors.

The results are generally presented in a logical manner and the figures are informative. However, some methodological limitations affect the robustness of the interpretation. The effective sample size appears limited given the number of statistical comparisons performed, particularly because only 22 composite samples were analyzed. The manuscript generates multiple interrelated quality indicators (chemical and microbiological parameters), yet no integrative multivariate analysis (e.g., PCA, cluster analysis, PERMANOVA) was conducted. Such analyses could strengthen the interpretation by identifying the main factors driving overall fish quality variation.

The CONCLUSION or summary is accurate and supported by the content.

The conclusion summarizes the main findings, but some statements appear stronger than the evidence presented. The authors attribute quality deterioration primarily to cold chain failures and poor handling practices, yet no direct measurements of storage temperature, storage duration, or transport conditions were collected. Therefore, some causal interpretations remain speculative. The conclusion should be moderated to better reflect the limitations of the study design.

The list of REFERENCES is comprehensive and appropriate.

The reference list is comprehensive and generally well selected. It covers relevant literature related to fish quality assessment, microbiological safety, post-harvest handling, and seafood preservation. The cited literature is appropriate and sufficiently supports the scientific background, methodology, and discussion presented in the manuscript. I did not identify any major inconsistencies between in-text citations and the reference list. Overall, the bibliography is adequate and appropriate for the scope of the study.

Please rate the TITLE of this paper.

[Poor] 1-5 [Excellent]

4

Please rate the ABSTRACT of this paper.

[Poor] 1-5 [Excellent]

3

Please rate the LANGUAGE of this paper.

[Poor] 1-5 [Excellent]

4

Please rate the METHODS of this paper.

[Poor] 1-5 [Excellent]

2

Please rate the RESULTS of this paper.

[Poor] 1-5 [Excellent]

3

Please rate the CONCLUSION of this paper.

[Poor] 1-5 [Excellent]

3

Please rate the REFERENCES of this paper.

[Poor] 1-5 [Excellent]

4

Overall Recommendation!!!

Return for major revision and resubmission

Comments and Suggestions to the Author(s):

The manuscript presents a relevant and timely study addressing an important food safety issue in a region where scientific data remain limited. The study provides valuable baseline information

on the physicochemical and microbiological quality of fresh and frozen fish marketed in coastal Togo, and the effort to combine multiple quality indicators is commendable.

However, authors should better justify the scientific basis for selecting this threshold. Moreover conclusions regarding cold chain failures and handling practices are not directly supported by measurements of storage temperature, storage duration, or transport conditions, making some interpretations speculative.

Finally, the manuscript requires improvement in figure presentation and would benefit from a stronger analytical discussion that goes beyond simply repeating the results.

Overall, despite these limitations, the study has scientific merit and publication potential, provided substantial revisions are undertaken to strengthen methodological justification, interpretation of findings, and overall analytical depth.

Reviewer C:

Recommendation: Revisions Required

The TITLE is clear and it is adequate to the content of the article.

Agree.

The ABSTRACT clearly presents objectives, methods, results, and conclusions.

The abstract follows IMRaD structure reasonably well, but with a few gaps worth noting.

A sharper objective sentence naming the actor-based comparison would match the rest of the abstract much better.

In conclusion, pH and TVBN values in the abstract are rounded to 2 decimals (5.72 and 6.96), while the Results section reports 3 decimals.

There are a few grammatical errors and spelling mistakes in this article.

The manuscript contains recurring grammatical patterns that should be corrected in a careful copyediting pass before publication.

The study METHODS are explained clearly.

Methods are clear in describing study design and sampling factors and, moderately clear in the freshness/TVBN/microbiology protocols.

It falls short of full reproducibility because of the missing formula, the unclear dilution sentence, missing incubation parameters.

The results are clear and do not contain errors.

Mostly clear, and importantly , the data are internally consistent in the vast majority of cases.

The CONCLUSION or summary is accurate and supported by the content.

The conclusion's headline comparative claim needs to be softened from a clean two-group split into language that reflects the actual three-tier result: Importers; Fishermen and Fish Shops; and Wholesalers. One explicit sentence on study limitations (single sampling season, small per-actor sample sizes), to frame the otherwise strong policy recommendations appropriately.

The list of REFERENCES is comprehensive and appropriate.

In overall acceptable. Please introduce the reference methods.

Please rate the TITLE of this paper.

[Poor] 1-5 [Excellent]

2

Please rate the ABSTRACT of this paper.

[Poor] 1-5 [Excellent]

2

Please rate the LANGUAGE of this paper.

[Poor] 1-5 [Excellent]

4

Please rate the METHODS of this paper.

[Poor] 1-5 [Excellent]

2

Please rate the RESULTS of this paper.

[Poor] 1-5 [Excellent]

3

Please rate the CONCLUSION of this paper.

[Poor] 1-5 [Excellent]

2

Please rate the REFERENCES of this paper.

[Poor] 1-5 [Excellent]

2

Overall Recommendation!!!

Accepted, minor revision needed

Comments and Suggestions to the Author(s):

Comment 1

The Methods state that “The pH was determined by the potentiometric method (ISO 10390:2021)”. ISO 10390:2021 is titled “Soil, treated biowaste and sludge — Determination of pH”; it specifies a 1:5 suspension of air-dried soil/sludge/biowaste in water, KCl or CaCl₂ solution and is not a food or fishery-products standard. Citing it for fish pH measurement is methodologically inappropriate, even though the general potentiometric principle is similar. Replace this citation with a standard or method actually validated for fish/meat matrices (e.g., ISO 2917 “Meat and meat products—Measurement of pH”, or an appropriate AOAC/AFNOR method), or, if the authors deliberately adapted the soil method, state this explicitly and justify the adaptation (sample:water ratio, extractant, equilibration time) rather than citing the soil standard as if it were the applied food method.

Comment 2

Based on Tables 1–2, the four actor groups used in the inferential statistics (Fishermen,

Importers, Wholesalers, Fish shops) are built from very few composite samples per group (as few as 3–5 for some groups, e.g., wholesalers). Kruskal-Wallis/Dunn comparisons and Spearman correlation on such small, unbalanced samples have very limited statistical power, and reported p-values (e.g., $p = 0.0021$, $p = 0.01768$) convey a precision that may not be warranted given the sample sizes.

Report the exact n per actor group directly in Table 5 (or a dedicated column), and add a sentence in the Discussion or as a study limitation acknowledging the constraints that small per-group sample sizes place on the statistical comparisons, particularly for wholesalers and fishermen.

Comment 3

Substantial portions of the Discussion (freshness, TVBN/pH, and microbiological subsections) restate numerical values already given in the Results, tables, and figures (e.g., re-quoting $I=3$, $I=2.4$, $I=2.2$, $I=1.8$; pH ranges; TVBN values per sample) before offering interpretation.

Trim the repeated numerical restatement and focus the discussion on mechanism (why importers' cold-chain control yields lower TVBN/microbial counts), comparison with the cited regional literature, and practical implications for post-harvest handling policy in Togo.

Reviewer D:

Recommendation: Revisions Required

The TITLE is clear and it is adequate to the content of the article.

Suggest title

QUALITY ASSESSMENT OF FRESH AND FROZEN FISH MARKET PRACTICE IN THE COASTAL AREA OF TOGO

See also

1. Hassoun, A., & Karoui, R. (2017). Quality evaluation of fish and other seafood by traditional and nondestructive instrumental methods: Advantages and limitations. *Critical Reviews in Food Science and Nutrition*, 57(9), 1976-1998.
2. Adeyeye, S. A. O., & Oyewole, O. B. (2016). An overview of traditional fish smoking in Africa. *Journal of culinary science & technology*, 14(3), 198-215.
3. Ganiero, E. G., Quenum, L. M., Dotche, I., Salifou, C. F., Karim, I. Y. A., & Karou, S. (2025). Evaluation of the Sanitary Quality of Sales Channels and Transport Equipment for Frozen Poultry Meat Imported Into Benin. *Journal of Food Quality*, 2025(1), 1990566.

The ABSTRACT clearly presents objectives, methods, results, and conclusions.

In summary, the quality of fish was satisfactory for importers, acceptable for fishermen and fish shops and unsatisfactory for wholesalers. This study reveals that fish quality varies depending on the actors involved and, therefore, on the practices along the distribution chain. The results reflect the lack of control over the cold chain, hygiene measures and good distribution practices. They highlight the need for awareness raising, for training on good fishing hygiene and good distribution practices, and for improvement or provision of post-harvest handling infrastructure.

Comments

The Abstract summary and conclusion are contradictory (they agree and disagree); please rework the language

There are a few grammatical errors and spelling mistakes in this article.

i suggest rewriting the abstract to give readers a good flow

The candidate's introduction it highlighted fish production in Africa and its impact on the economy, failed I bot to recognize the leading fishing production in the world, like China. China is the undisputed leading fishing and seafood-producing country in the world. It accounts for over a third of the world's total fish and aquaculture production, yielding roughly 88.6 million tonnes annually.

The study METHODS are explained clearly.

The methodology is clear and explains the process

The results are clear and do not contain errors.

The study results are scientifically sound; my worry is. How do you conclude the results if the transporters, shops and logistics from Togo to the market end are disrupted? Is there any traceability from Togo to the marketplace to guide the researcher?

The CONCLUSION or summary is accurate and supported by the content.

Please borrow some words from the conclusion and include them in the abstract. Also, the conclusion should recognise the discussion and results without bringing up new topics which were not discussed in the introduction and results.

Limitations and further study are missing

The list of REFERENCES is comprehensive and appropriate.

Bibliography and reference APA style ?? Work on reference 15

If is Havard reference or APA style? Please rework it to align with the guidelines

Please rate the TITLE of this paper.

[Poor] **1-5** [Excellent]

4

Please rate the ABSTRACT of this paper.

[Poor] 1-5 [Excellent]

4

Please rate the LANGUAGE of this paper.

[Poor] 1-5 [Excellent]

4

Please rate the METHODS of this paper.

[Poor] 1-5 [Excellent]

5

Please rate the RESULTS of this paper.

[Poor] 1-5 [Excellent]

5

Please rate the CONCLUSION of this paper.

[Poor] 1-5 [Excellent]

4

Please rate the REFERENCES of this paper.

[Poor] **1-5** [Excellent]

4

Overall Recommendation!!!

Accepted, minor revision needed

Comments and Suggestions to the Author(s):

The topics sound current, and they capture a very sensitive area in Africa, however the comparison with other frozen sectors such as horticulture and poultry will also add knowledge to authors and potential leaders

Please work seriously on the provided comments before submitting for publication

The abstract needs strong language to capture the leaders' attention
