

REVIEWER'S REPORT

Manuscript No.: IJAR- 58654

Title: *Qualité physicochimique et contamination par l'aflatoxine B1 des graines d'arachide (Arachis hypogaea L.) stockées dans la bande sud-centre du Niger.*

Recommendation:

Accept as it is

Accept after Minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity			✓	
Significance			✓	

Reviewer Name: **ANAPANA GOPAL**

Reviewer's Comment for Publication.

General Comments

The manuscript addresses an important food-safety and post-harvest management issue in Niger. The study evaluates physicochemical characteristics and aflatoxin B1 (AFB1) contamination of groundnuts stored in three types of warehouses, using samples collected before and after six months of storage. The analytical approach includes proximate composition, HPLC-FLD determination of AFB1, ANOVA/Tukey analysis, Pearson correlation, and PCA.

The topic is relevant and the dataset has potential value. However, substantial methodological, statistical, and interpretational issues need to be addressed before publication.

Minor Comments

1. Statistical design needs substantial clarification

The study uses the same storage system over two time points (T0 and T1), with measurements before and after six months. However, the manuscript states that **one-way ANOVA** and Tukey HSD were used.

The authors should justify this statistical design. Because time and warehouse type are both important factors, a **two-factor analysis incorporating storage period and warehouse type**, preferably accounting for repeated measurements where appropriate, would be more suitable.

The statistical analysis should clearly distinguish:

- effect of storage duration;
- effect of warehouse type;
- interaction between storage duration × warehouse type;
- within-sample/within-producer changes.

This is particularly important because the sampling involved 24 producers and measurements at T0 and T1.

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2. Experimental unit and replication are unclear

The manuscript reports 24 producers and 48 composite samples, distributed among three warehouse types, with 16 samples per warehouse type.

However, it is not sufficiently clear whether:

- the same producers were followed from T0 to T1;
- each producer represents one biological replicate;
- samples were pooled before analysis;
- technical replicates were performed for each chemical analysis.

The authors should explicitly define the **experimental unit, biological replication, and technical replication**.

3. Important inconsistency concerning AFB1 and the European limit

The Results section states that AFB1 concentrations "exceed" the European limit of 8 µg/kg in MH at T1, but the reported value is **6.82 ± 2.88 µg/kg**, which is below 8 µg/kg.

This is a clear numerical/interpretational error and must be corrected.

The sentence should not state that the European limit was exceeded.

4. Minor inconsistency between the Results and Conclusion regarding MMD

The conclusion states that MMD has **significantly lower humidity and AFB1 concentrations than MH**.

However, Table 3 reports AFB1 values and only indicates "**ns**" for the T0–T1 comparisons.

The manuscript does not clearly present a statistical test demonstrating that MMD is significantly different from MH for AFB1.

Therefore, the authors should either:

- provide the appropriate statistical comparison among warehouse types, or
- remove the claim of a statistically significant difference.

5. Interpretation of the physicochemical results is problematic

The manuscript states that the physicochemical parameters are generally compliant with Codex standards. However, Table 2 shows that **protein values are below the stated 25–30% reference range**, and fibre values after storage are also below the stated 8–12% range in several groups.

The authors need to distinguish between:

- actual regulatory limits;
- nutritional reference values;
- compositional ranges reported in literature.

Not every compositional parameter necessarily constitutes a "Codex standard" or regulatory compliance criterion. The source and regulatory status of each reported range should be verified.

6. The interpretation of weight loss requires stronger evidence

The study reports approximately **21.3% loss in the weight of 100 seeds** after six months.

The Discussion attributes this to dessication, respiration, enzymatic/microbial degradation, insects, rodents, and rancidity.

However, the study does not appear to have directly measured:

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- insect infestation;
- fungal load;
- rodent damage;
- respiration;
- lipid oxidation;
- moisture loss at multiple time points.

Therefore, these mechanisms should be presented as **possible explanations**, not demonstrated causes.

7. AFB1 contamination was detected at T0, but its origin cannot be established

The authors interpret detection of AFB1 at T0 as evidence that contamination probably originated during harvesting, field drying, or transportation.

This is plausible, but the study did not examine these stages directly.

The wording should therefore be changed from a causal interpretation to something such as:

"The presence of AFB1 at T0 suggests that contamination had occurred before storage; however, the specific stage at which contamination originated could not be determined."

8. Pearson correlation should be interpreted cautiously

The reported correlation between moisture and AFB1 is **$r = 0.34$, $p = 0.019$** .

This represents a statistically significant but relatively weak-to-moderate association.

The manuscript currently uses language suggesting that the correlation "confirms" the causal role of moisture. Correlation alone does not establish causality.

The authors should use terms such as "**associated with**" or "**positively related to**" rather than implying causation.

9. PCA requires additional methodological information

The PCA reportedly explains 52% of total inertia using two dimensions.

The authors should report:

- whether variables were standardized;
- eigenvalues;
- percentage variance explained by each component;
- factor loadings/contributions;
- criteria used for retaining components.

The figure caption also states "Analyse des composantes multiples" while the text describes an **ACP (Analyse en composantes principales)**. The terminology should be standardized.

10. Sample size is relatively small

Only 24 producers were included, with 48 composite samples overall.

The authors should acknowledge the limited sample size and discuss its implications for:

- statistical power;
- generalizability;
- detection of differences among warehouse types;
- correlation analysis.

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11. Abstract should be revised

The abstract is informative, but some conclusions need correction. In particular, the statement concerning the European 8 µg/kg threshold should be corrected because the reported maximum value is 6.82 µg/kg.

The abstract should also clearly state the study design and number of producers/samples.

12. Introduction

The Introduction establishes the importance of groundnut production and AFB1 contamination well. The research gap and objectives are clearly stated.

However, the authors could strengthen the Introduction by explicitly stating the **research hypothesis** and explaining why comparison of these three specific storage systems is scientifically important.

13. Methods need quality-control information for HPLC

The manuscript provides useful details on extraction, immunoaffinity purification, HPLC-FLD detection, and calibration range.

However, analytical quality-control information is missing, including:

- limit of detection (LOD);
- limit of quantification (LOQ);
- recovery percentage;
- repeatability/precision;
- blank samples;
- certified reference material or quality-control samples.

These should be reported for a reliable AFB1 analytical study.

14. Moisture measurement should be reported consistently

The manuscript reports very low moisture in MMD at T1 (**2.93 ± 0.49%**).

The authors should discuss whether such a low moisture value is biologically/technologically realistic and verify that the result is not related to sampling, drying, or analytical procedures.

15. References and regulatory citations require checking

The reference list contains useful literature on groundnut storage and aflatoxin contamination.

However, the citation given as "**CE, 2026**" in the Methods appears inconsistent with the cited European regulation and should be carefully checked.

All regulatory references should be presented accurately and consistently.

16. Language and formatting

The manuscript requires careful French language editing. There are numerous spacing, punctuation, typography, and compound-word inconsistencies, for example:

- "Arachishypogaea" → **Arachis hypogaea**
- inconsistent spacing around punctuation;
- inconsistent use of "taux d'humidité";
- inconsistent formatting of statistical notation;
- inconsistent presentation of units;

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- "Figure1" → **Figure 1**.

A professional language and formatting revision is recommended.

Strengths of the Manuscript

1. **Relevant research topic** concerning food safety and post-harvest management.
2. Field-based study conducted in Maradi and Zinder.
3. Comparison of three practically relevant storage systems.
4. Measurements performed at both T0 and after six months.
5. Use of established AOAC analytical methods.
6. AFB1 determination by HPLC with immunoaffinity purification.
7. Inclusion of correlation and multivariate analysis.
8. Practical recommendations regarding improved storage and aflatoxin monitoring.

Overall Recommendation

The manuscript has **scientific and practical merit**, but I recommend **Minor Revision** because several important issues affect the validity and interpretation of the findings.

Final decision: MINOR REVISION.