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## REVIEWER'S REPORT

**Manuscript No.: IJAR-58575**

**Title: Effect of incorporating blood meal into feed on the growth performance of catfish (Clarias gariepinus),**

**Recommendation:**

Accept as it is .....

Accept after minor revision.....

**Accept after major revision...YES**.....

Do not accept (*Reasons below*) .....

| Rating | Excel. | Good | Fair | Poor |
|---|---|---|---|---|
| Originality | | ☐ | | |
| Techn. Quality | | | ☐ | |
| Clarity | | | ☐ | |
| Significance | | ☐ | | |

**Reviewer's ID: JPR-094**

## Detailed Reviewer's Report

**## Reviewer's Report**

****Manuscript Title:** *Effect of Incorporating Blood Meal into Feed on the Growth Performance of Catfish (Clarias gariepinus)***

**### Overall Evaluation**

**The manuscript investigates the effect of incorporating blood meal (30% and 40%) into diets of juvenile *Clarias gariepinus* on growth performance, feed utilization, survival, and economic profitability. The study addresses an important issue in aquaculture, namely the reduction of feed costs through the use of locally available protein sources. The topic is relevant, particularly for developing countries. However, the manuscript has several scientific, methodological, statistical, and**

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**REVIEWER'S REPORT**

**presentation deficiencies that require **major revision** before it can be considered for publication.**

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**## Strengths**

**1. Addresses a practical and economically important problem in aquaculture by exploring alternative protein sources.**
**2. The experimental trial lasted 63 days, which is adequate to evaluate growth performance.**
**3. Growth, feed utilization, survival, and economic parameters were evaluated simultaneously.**
**4. The manuscript includes an economic analysis, increasing its practical relevance.**
**5. Triplicate experimental design improves reliability of observations.**
**6. Results indicate that 30% blood meal produced better growth and profitability than 40% inclusion.**
**7. The work is relevant for fish farmers in regions where blood meal is inexpensive and readily available.**

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**## Weaknesses**

**### 1. Limited novelty**

*** Numerous previous studies have already investigated blood meal inclusion in *Clarias gariepinus*.**

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*** The manuscript compares only two inclusion levels (30% and 40%), providing limited new scientific information.**

**### 2. Experimental design is weak**

*** No control diet (0% blood meal or commercial diet) was included.**
*** Without a control, the real benefit of blood meal cannot be established.**

**### 3. Feed formulation lacks detail**

*** Nutrient composition is incomplete.**
*** Amino acid profile, lipid content, energy values, moisture, and ash are absent.**
*** Blood meal quality analysis is not reported.**

**### 4. Statistical analysis is insufficient**

*** ANOVA assumptions (normality and homogeneity) were not verified.**
*** Exact p-values are missing.**
*** Standard deviations are reported, but confidence intervals and effect sizes are absent.**

**### 5. Water quality concerns**

*** Dissolved oxygen values (<1 mg/L) are extremely low.**
*** The manuscript should justify how such low oxygen levels did not adversely affect fish growth.**

**### 6. Economic analysis is incomplete**

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*** Several operational costs were intentionally excluded.**

*** The economic conclusions therefore have limited applicability to commercial aquaculture.**

**### 7. Discussion lacks depth**

*** The discussion mainly repeats the results.**

*** Limited explanation of physiological mechanisms.**

*** Little comparison with recent studies published after 2022.**

**### 8. Language quality**

*** Numerous grammatical errors.**

*** Inconsistent terminology.**

*** Several awkward sentences require professional English editing.**

**### 9. References**

*** Several references are outdated.**

*** Some citations are incomplete or improperly formatted.**

*** More recent literature (2023–2025) should be included.**

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**# Key Points**

**### Positive**

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*** Practical application in low-cost aquaculture.**

*** Simple feeding strategy.**

*** Economic relevance.**

*** Acceptable survival rates.**

*** Adequate experimental duration.**

**### Negative**

*** Weak novelty.**

*** Absence of a true control treatment.**

*** Limited statistical rigor.**

*** Incomplete nutritional characterization.**

*** Weak discussion.**

*** Language requires major editing.**

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**# Significance**

**### Scientific Significance**

****Moderate****

**The study confirms previous findings rather than providing a major scientific advancement.**

**### Practical Significance**

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****High****

**The work may help reduce feed costs for small-scale fish farmers using locally available blood meal.**

**### Originality**

****Moderate****

**The manuscript contributes incremental information by comparing 30% versus 40% blood meal incorporation under Togolese farming conditions.**

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**# Recommendation**

**## Decision: **Major Revision****

**### Reasons**

**The manuscript requires substantial improvements before publication because:**

**1. A proper control diet is absent.**
**2. Novelty is limited.**
**3. Nutritional characterization of diets is incomplete.**
**4. Statistical analysis requires improvement.**
**5. Water quality interpretation is inadequate.**

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**6. Economic analysis should include additional production costs or justify exclusions.**

**7. Discussion needs deeper comparison with recent literature.**

**8. English language and formatting require professional revision.**

**9. References need updating and standardization.**

**Only after these issues are satisfactorily addressed should the manuscript be reconsidered for publication.**

*Major Revision Justification (Line-by-Line Reviewer Comments)*

| Line No. | Issue Identified | Reason for Major Revision |
|---|---|---|
| **5–7** | Objective is too general. | The study objective should clearly state the hypothesis and explain why only 30% and 40% blood meal inclusion levels were selected. |
| **7** | Study design is inadequately described. | "Experimental study to reduce the cost of fish feed" is vague. The experimental design (completely randomized design, treatments, replicates) should be specified. |
| **8–16** | Methodology lacks important experimental details. | The manuscript does not clearly describe tank randomization, environmental control, feeding calculations, and management practices, limiting reproducibility. |
| **10–13** | No control treatment included. | Only two blood meal inclusion levels (30% and 40%) were compared. A diet without blood meal (0%) or a commercial control diet is essential for evaluating the true effect of blood meal. |
| **12–14** | Feed formulation is incomplete. | Only ingredient percentages are reported. Proximate composition (lipid, ash, fiber, moisture, energy) and amino acid profile are absent. |
| **17–22** | Abstract lacks statistical information. | Statistical significance (P-values) should be reported rather than only descriptive results. |
| **21–22** | Conclusion is too strong. | Recommending 30% blood meal incorporation is premature because only two inclusion levels were tested and no control diet was evaluated. |
| **25–52** | Literature review is outdated. | Most references are older than 10 years. Recent publications (2023–2025) on alternative protein sources and blood meal in aquaculture should be |

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| Line No. | Issue Identified | Reason for Major Revision |
|---|---|---|
| | | included. |
| **45–52** | Research gap is not clearly established. | Previous studies are cited, but the manuscript does not clearly explain how the present study advances existing knowledge. |
| **55–62** | Water management information is insufficient. | Water exchange rate, aeration system, and biosecurity measures are not adequately described. |
| **64–66** | Biological material characterization is incomplete. | Fish age, health status, sex, and acclimation management are not reported. |
| **68–71 (Table 1)** | Feed formulation lacks nutritional analysis. | The diets should include proximate composition and nutrient digestibility rather than ingredient proportions alone. |
| **73–85** | Experimental protocol lacks justification. | The rationale for selecting feeding rates (2.8–2%) and blood meal inclusion levels is not explained. |
| **86–94** | Blood meal preparation lacks quality evaluation. | No microbiological analysis, moisture determination, or nutrient analysis of the prepared blood meal is presented. |
| **95–104** | Feed preparation lacks quality control. | Pellet size, drying conditions, storage duration, and pellet stability in water are not reported. |
| **105–113** | Analytical parameters are incomplete. | Important performance indices such as Specific Growth Rate (SGR), Protein Efficiency Ratio (PER), and Condition Factor were omitted. |
| **116–120** | Statistical analysis is inadequate. | Assumptions of ANOVA (normality and homogeneity of variance) are not mentioned. Exact P-values and effect sizes are absent. |
| **124–128** | Dissolved oxygen values are unusually low. | Dissolved oxygen values below 1 mg/L are much lower than recommended for optimal fish culture and require scientific justification. |
| **130–154** | Results presentation is limited. | Growth performance is reported, but confidence intervals and variability measures are limited. |
| **133–138 (Table 3)** | Sample size is not clearly indicated. | The number of observations used for statistical analysis should be explicitly reported. |
| **140–154** | Biological interpretation is insufficient. | The manuscript reports statistical differences but provides limited physiological explanation for the observed growth responses. |
| **159–183** | Economic analysis is incomplete. | Only selected production costs were considered. Labor, depreciation, maintenance, mortality, and |

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|---|---|---|
| | | other operational expenses were excluded, reducing practical applicability. |
| **170–173** | Important production costs omitted. | Excluding major costs may overestimate profitability and limits the reliability of the economic conclusions. |
| **185–246** | Discussion lacks critical analysis. | The discussion mainly repeats results instead of critically comparing them with previous studies and explaining possible mechanisms. |
| **193–196** | Water quality interpretation needs clarification. | The explanation regarding low dissolved oxygen and air-breathing ability should be supported with stronger evidence because prolonged hypoxia can still influence growth. |
| **200–233** | Comparison with previous studies is limited. | Recent literature is missing, and contradictory findings are not adequately discussed. |
| **220–223** | Nutritional explanation is incomplete. | The discussion on lysine and methionine deficiency should be supported by nutrient composition data or relevant references. |
| **235–247** | Economic conclusions are overstated. | The recommendation of A1 feed should be supported by a more comprehensive cost-benefit analysis. |
| **248–260** | Conclusion overgeneralizes findings. | Recommendations should be limited to the tested experimental conditions because only two diets were evaluated. |
| **267–335** | References require revision. | Several references are outdated, inconsistently formatted, incomplete, or contain citation errors. Recent peer-reviewed references should be added. |
| **Entire manuscript** | English language requires improvement. | Numerous grammatical errors, inconsistent terminology, spacing issues, and formatting problems reduce readability and require professional language editing. |

**Overall Justification for Major Revision**

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The manuscript addresses an important topic in aquaculture and has practical relevance. However, **major revision is necessary** because of several substantia l shortcomings:

**Limited novelty** due to extensive previous research on blood meal incorporation in *Clarias gariepinus*.

**Absence of a true control diet**, making it difficult to determine the actual benefit of blood meal inclusion.

**Incomplete feed characterization**, lacking proximate composition and amino acid analysis.

**Insufficient methodological detail**, limiting reproducibility.

**Weak statistical reporting**, including missing assumption testing and exact P-values.

**Questionable interpretation of very low dissolved oxygen values**, which requires stronger justification.

**Incomplete economic analysis**, excluding several important production costs.

**Discussion lacks critical interpretation** and comparison with recent literature.

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**Conclusions are stronger than the evidence supports**, given that only two inclusion levels were tested.

**Language, formatting, and references require substantial revision** to meet publication standards.

**Editorial Recommendation: Major Revision.** The manuscript has practical value but requires substantial improvements in methodology, statistical analysis, scientific interpretation, and presentation before it is suitable for publication.