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Peer Review

Review of: "Changes in Leukocyte Indices of Holstein Cows Under Prolonged Heat Stress Conditions"

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Review of the manuscript "Changes in Leukocyte Indices of Holstein Cows Under Prolonged Heat Stress Conditions"

This study presents a novel approach to assessing heat stress (HS) in dairy cattle by utilising leukocyte indices as potential biomarkers. The research holds significant practical relevance, as complete blood count (CBC)-based indices offer a more accessible and cost-effective alternative to traditional biomarkers such as cortisol. The findings could contribute to improving the efficiency of HS monitoring and management in dairy production systems.

The study demonstrates several strengths. The innovative application of leukocyte indices in HS evaluation provides a promising avenue for developing alternative diagnostic tools. The practical implications are noteworthy, as identifying reliable and inexpensive HS biomarkers could facilitate routine screening in dairy farms. The study also presents a thorough statistical analysis, employing non-parametric methods appropriate for the data structure. Moreover, the selection of indices, including the Neutrophil-to-Lymphocyte Ratio (NLR), Lymphocyte-Granulocyte Index (LGI), and Nuclear Shift Index (NSI), aligns well with existing knowledge of immunological responses to environmental stressors.

A few areas could benefit from further elaboration. The discussion could be expanded to include a broader comparison of how leukocyte indices correlate with established HS biomarkers such as cortisol, glucose levels, or oxidative stress markers. Incorporating references to similar approaches in other livestock species or even human studies could strengthen the justification for adopting leukocyte indices as reliable indicators of HS.

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The conclusions could also be refined to emphasise the study's contribution more explicitly. If the results confirm that leukocyte indices serve as effective HS biomarkers, this should be stated more definitively. Highlighting the practical applications of these findings in dairy herd management would enhance the study's impact.

This research represents an important step forward in understanding the immunological shifts induced by HS and suggests a potentially valuable method for monitoring cattle welfare. The use of CBC-based leukocyte indices as a diagnostic tool for HS is a promising direction, which could lead to improved cost-efficient monitoring strategies in dairy farming.

Declarations

Potential competing interests: No potential competing interests to declare.