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Peer Review

Review of: "Polycyclic Aromatic Hydrocarbons in Brazilian Food: A Critical Review of Levels, Human Health Risk Assessment, and Potential Gaps in the Recent Literature"

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The article reviews the research results of 36 articles related to concentrations of PAHs in food in Brazil. Based on these results, health risk characterization was performed using risk assessment methodologies, including Estimated Daily Intake, Hazard Quotient (HQ), and Cancer Risk (CRisk) calculations. In general, the manuscript should be significantly improved due to its poor scientific quality. There are many issues that need to be clarified in this manuscript as presented below:

1. Table 3 and Table S1 weren't mentioned in the manuscript.
2. According to the International Agency for Research on Cancer (IARC), naphthalene is classified in Group 2B (possibly carcinogenic to humans). The Toxic Equivalency Factor (TEF) for naphthalene is 1000 times lower than that of benzo(a)pyrene. In addition, Table 3 showed that most data on naphthalene in food were not available, which means these studies did not focus on a LMW like naphthalene. Due to inadequate data on naphthalene, the calculation of its CRisk seems not to be meaningful. Why did the authors calculate CRisk for naphthalene instead of all PAHs or HMW with higher TEF? From my point of view, this point is unreasonable in the review manuscript.
3. The authors should provide the Oral Slope Factor (OSF) and Reference Oral Dose (RfD) used in the manuscript.
4. The content of the article has not met expectations for a review article in terms of poor data analysis and an informative review of previously published studies in Brazil. For example, no figures were presented in the manuscript. Table 2 was not presented in a particularly logical manner; the author

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should consider organizing the data by individual compound or by food type to make it easier to follow and compare across studies. Additionally, a note explaining the meaning of the "-" symbol in the table should be included.

5. It can be said that the food processing method plays an important role in the concentrations and profiles of PAHs in food. However, no comparisons were made to provide insightful discussions on the processing method in this manuscript.
6. The reviewer does not highly value the content presented in Section 4.1, "Role of Disparities in Research Infrastructure Across the States," as it was not closely related to the main content of the manuscript. Instead, the authors should consider conducting a more in-depth analysis of the sources and composition of each constituent based on previously published studies. Such an approach would likely improve the scientific quality of the manuscript.
7. Table 5 showed that the CRisk values of all 16 types of food were higher than 10^{-5} (significant risks). The authors should check them carefully. For example, in Table 2, the max total of 12 PAHs in vegetable oil blends could be 79.19 µg/kg (reference no. 31), while in Table 5, $C_{summation}$ = 0.8628 mg/kg = 862.8 µg/kg, Crisk = 3.76 x 10^{-2}. So what is $C_{summation}$?

Declarations

Potential competing interests: No potential competing interests to declare.