

Editorial

Toxic heavy metals content of baby food products—An unmet challenge

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The toxic heavy metal (THM) content of baby food products has gained significant attention in recent years. Reports by organizations such as Consumer Reports and several advocating groups have revealed that many food products for babies and young children contain high levels of THM such as arsenic, lead, cadmium, and mercury. In 2021, the Subcommittee on Economic and Consumer Policy Committee on Oversight and Reform U.S. House of Representatives released two reports detailing the THM content of tested baby food products manufactured and marketed by several manufacturing companies. These reports indicated that a significant number of the tested products contained high, and, in some cases extremely high, levels of THM. This, and information in other peer- and non-peer-reviewed publications have raised serious concerns and questioned the safety of baby food products. These concerns stemmed from the mounting information about the multitude of adverse effects of THM on the health and well-being of babies and young children. Exposing babies and young children to THM, through consumption of contaminated food, has been linked to the evolution of different cancerous- and non-cancerous illnesses. Such exposure has also been identified among the causes for different developmental- and cognitive problems and challenges in babies and young children. Moreover, the susceptibility of babies and young children to ingestion of food contaminated with THM is higher than that in older age. Babies consume larger amounts of food relative to their body mass than older children and adults, and the mechanisms that are responsible for clearing THM from the human body are not yet fully developed. The overall result of the latter is significant bioaccumulation of the ingested THM in the body of babies and toddlers. Rice-based products are the first food products that are recommended for babies after weaning, and thus the level of THM, especially that of inorganic

arsenic in these products, is of great importance. The aforementioned reports indicated that rice-based baby food products contain very high levels of arsenic. Thus, there is a critical need to lower the level of THM, and especially that of inorganic arsenic, in rice-based baby food products. Rice presents a significant challenge in the latter regard because rice plants uptake and accumulate significantly more arsenic than other grains, fruits, and vegetables that are utilized in manufacturing baby food products. It has been demonstrated that utilization of polished white rice rather than whole, brown rice, as well as partially replacing rice with other grains can lower the arsenic content in rice-based baby food products. Some reports indicated that pre-washing and pre-cooking rice prior to its incorporation into baby food products can lower the inorganic arsenic content of rice-based products. However, a systematic and thorough research effort to fully explore and quantify the efficacy of such post-harvest operations is needed.

Regulations about the level of THM in baby food products are partial and lag significantly. In August 2021, after the release to the public domain of reports, such as the aforementioned ones, the FDA has initiated a campaign aimed at lowering the level of THM in baby food products to “Closer to Zero”. This campaign has lagged its own stated timelines and is “a work in progress”. So far, regulations and guidelines for the industry of only very limited specific levels of THM in few specific products have been published. Legislators and regulatory agencies must therefore update, enhance, and fully implement regulations regarding the levels of HTM in food products for babies and young children.

By law, the ultimate responsibility for food safety and quality rests with the food industry. Parents have the legal right to expect that commercial baby food products that they feed to their babies and young children do not contain elevated concentrations of THM. So far, the concentration of THM that is safe for babies and young children has not been identified. Therefore, the only safe approach that can protect babies and young children from the harmful effects of ingested THM is developing and implementing well-designed strategies that can ensure that baby food products contain the lowest possible concentration of THM. However, the aforementioned data and information indicate that this objective has not been met and that much more must be done.

Unlike other chemical hazards that can be removed during food processing, THM content of the raw materials and ingredients that are used to manufacture food products cannot be removed and, except for rice, cannot be lowered during the manufacturing process. Thus, controlling the levels of THM in baby food products should be focused on utilizing raw materials and ingredients with the lowest possible levels of THMs. Additionally, processes and facilities must be designed in a way that ensures that heavy metals are not introduced during the processing phase though utilization of contaminated water and/or inadequate equipment.

The concentration of THM in fruits, vegetables, and grains is governed by the combined influence of the THM contamination of the soil in which agricultural crops are grown, the THM contamination of the water that is used for irrigation and the THM contamination of the environment in which crops are grown. The THM contamination level in soil, water, and the environment varies significantly, among- and within- regions. The regional THM concentration in soil is affected, among other things, by the mineral composition of the rock bed in the region and by the industrial and agrochemical history of the region. For some parts of the world, information and data about the level of such contamination exists, while for other parts of the globe, such information does not exist. For a given region, significant within- and among-species and varieties differ in the uptake of heavy metals and should also be considered. Manufacturing baby food products with the lowest possible level of THM is thus

critically dependent on identifying and developing specific regions, crops, varieties, and practices that can collectively ensure sourcing of raw materials with the lowest possible THM concentration. Additionally, every batch of raw material that is to be processed should be tested for its THM content, and the test results must be challenged against the relevant regulations and specifications. Additionally, the THM content of every batch of finished baby food product should be tested, and the results must be shared with the public. A recent legislation in California addresses some of the latter and is a step in the right direction toward safer baby food products. However, we must realize that, unfortunately, the reported concentration of THM in the tested baby food products indicates that the stated objective of the FDA, namely “Closer to Zero”, has not been met. The safety and well-being of babies and young children require meeting this unmet challenge and objective.

Use of AI tools declaration

The authors declare they have not used Artificial Intelligence (AI) tools in the creation of this article.

Conflicts of Interest

Prof. Moshe Rosenberg is the editor-in-chief for AIMS Agriculture and Food. The author declares no conflict of interest.



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