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Determination of alkenylbenzenes in Indonesian plant-based drink and associated safety assessment using the Margin of Exposure (MOE) approach

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This study was done to determine the alkenylbenzenes in Indonesian plant-based drink and safety assessment using the Margin of Exposure (MOE) approach. The level of alkenylbenzenes reached 0.4 to 563.5 µg/g samples. 24 over 25 samples positively contained alkenylbenzenes with major compounds are methyleugenol. The Estimated Daily Intake (EDI) was calculated for individual and combined exposure used the equal potency and Toxic Equivalency (TEQ) approach. For the assumption, Indonesian lifetime of 69 years and average body weight of 54 kg were used. The EDI ranged from 0.1 to 48.3 mg/kg body weight per day for assuming consumption of 1 cup each day. The combined EDI values considered assuming equal potency was amounted 23.7 mg/kg body weight per day. In addition, the combined EDI based on Toxic Equivalency Factors (TEF) of methyl eugenol calculated 74.7 mg methyl eugenol equivalents/kg body weights per day. The individual MOE was calculated vary from 168 to 183.901. For the combined exposure, the MOE values were reached 645 and 205 for equal potency approach and TEQ approach, respectively. These values showed lower than 10,000 except for sample 18 and sample 20, thus it may be priority for risk management. Nevertheless, the consumption of samples would not for a lifetime, the short time exposure extrapolated by Haber's rules showed increasing of MOE and lead to low priority for risk management. All in all, the consumption of plant-based drink will be at risk if the consumer consumes high concentration alkenylbenzenes in long period of time.

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