

Temporal and spatial trend of polychlorinated dibenzo-p-dioxin/ dibenzofuran and dioxin like-polychlorinated biphenyl levels in food from Taiwan markets during 2004 to 2012 and 2013 to 2018

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The levels of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) or dioxin-like polychlorinated biphenyls (DL-PCBs) in foodstuffs have decreased over the past decade in many countries. However, the trend for the levels of these compounds in foodstuffs in Taiwan remains unknown. In this study, we compared the temporal and spatial trend of PCDD/Fs and DL-PCBs in nine foodstuff categories purchased from Taiwan markets from 2004 to 2012 and 2013 to 2018. The PCDD/Fs/DL-PCBs level were expressed as World Health Organization toxic equivalents (WHO98-TEQ) in the different foodstuffs for comparison. In Taiwan, a decreasing trend of PCDD/Fs or dioxin-like PCBs (dl-PCBs) was observed in meat, dairy, eggs, and vegetables, whereas an elevated trend was observed in cereals or the levels were nearly equal in fruits and oils at alternative time shift. DL-PCBs contributed to 60-65% toxicity equivalence levels in fish and seafood, but only to 13-40% in meat and cereal samples. The decreasing trend was consistent with the results in other countries; however, the trends in cereals, fruits, and oils were in contrast to previous results reported in other countries. Cereals and fruits are important crops in southern Taiwan, and the local pollution generated by industries or incinerators may seriously affect the distribution of PCDD/Fs and dl-PCBs. To ensure food safety, a risk assessment for residents living in different areas were assessed for all food categories simultaneously.

Keywords: diet, food, PCDD/Fs, DL-PCB, time trend, location difference